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ORIGINAL COMMUNICATIONS.

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CORRECTIVE RHINOPLASTY.*

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Where the nose has been partially or completely destroyed by disease or trauma, the individual so disfigured is for the most part an object of pity and sympathy, but at the same time he is not accorded those privileges in the social and commercial world enjoyed by other persons. For hundreds of years past, therefore, since the appearance of Tagliacozzi's work in 1597, rhinoplasty for the relief of such conditions has been an accepted surgical procedure.

For some reason, however, corrective rhinoplasty has not received the attention which it merits. By corrective rhinoplasty is meant those operations which have for their object the restoration to a presentable form, size and position noses which, from accidents or congenital causes, are so deformed as to give to the individual an unsightly appearance. Rhinologists in general have shown but little inclination to develop this line of surgery, although the feasibility and advisability of the work have been proved by the excellent results obtained by Roe, Joseph, Berens and others for a number of years past. This indifference may be due to the fact that there has been absolutely no systematic treatise on this work until the appearance of Joseph's article in the German Handbuch about a year ago. An operator, however clever, might lack sufficient originality to develop a proper technic

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along these lines in the absence of such literature. Then also, there still exists a feeling among many, that so long as some sort of nose is present we are not justified in tampering with the work of providence.

A general belief prevails that persons so disfigured are prompted only by vanity to seek relief, but men who have done most in this field have cited many instances which abundantly show that such patients are so frequently objects of comment and ridicule that they become keenly self-conscious, and a physical depression is brought about, amounting in many instances to melancholia. Joseph cites cases of actual attempt at suicide owing to this depressing effect upon the nervous system.

Figure 1. Framework of nose (Gray).

The interest of the writer was first attracted to this subject about four years ago when two patients applied for relief from such conditions. One, a young woman, 22 years of age, had a horribly flattened and laterally displaced nose, following a badly managed fracture sustained by falling down stairs. This girl's face, otherwise quite pretty, was very much marred by the deformed nose—her disfigurement was most noticeable, and she was, consequently, in a continually depressed state.

The second case was that of a young man with a congenitally over-sized nose. So enormous was this man's nose that he was constantly reminded of it by comments of persons with whom he had to come in contact. Further, he felt than any advancement

with the concern that employed him was actually hampered by his appearance. He also brooded much over his condition, and expressed a willingness to spend all of his small savings if he could but be freed from such disfigurement.

The mental condition of these two individuals at this time made so profound an impression upon me that I was led to take up this work seriously, and at once began to search literature for light on the subject and to work it up in the dead-house and clinic.

Text-books on general surgery furnished no information since they detailed only methods where skin incisions were employed. Even as late as 1911, Kolle's books on "Plastic surgery" makes but casual mention of any other procedure. Books on rhinology

Figure 2. Bones and cartilage of septum, left side (Gray).

have had so little to say on the subject that but slight assistance could be obtained from them. A number of interesting monographs have been written in this country and abroad since 1887 (when Roe's first publication appeared), from which much can be learned, but they are, with few exceptions, mostly made up of case-reports, with pictures of subjects before and after operation, leaving much to the reader's imagination as to finer details of technic, so important for a successful outcome in these operations.

An endeavor will here be made to describe more fully details of technic which have yielded best results in the work thus far done by the writer, in the hope that the little he has learned may interest others in the work, so that it may be given the standing in surgery which seems its due. This might also help to do away with the so-called "beauty specialist" who flourishes in many of our

larger cities at the expense of those who should, as a matter of fact, be cared for by the skilled rhinologist. For only the rhinologist is capable of relieving the impaired nasal breathing so frequently existing along with the external deformity.

Classification: The deformities here under consideration are divided into two classes: (1) idiopathic or congenital; (2) acquired. To the former belong the over-developed nose, hump-nose, congenital saddle and pug nose, while to the latter belong all sorts of grotesque alterations in shape and position of the nose caused by

Figure 3. Rubber apron used by writer.

fracture or dislocation, and likewise by destruction of the bony or cartilaginous framework from syphillis, tuberculosis and lupus.

For practical purposes, a further subdivision is generally made into deformities affecting the bony and those affecting the cartilaginous portions, although both are frequently involved at the same time. The various types of deformity have been admirably described by Roe, whose classification seems the most comprehensive.

Anatomical: Reference to Figures 1 and 2 reminds us of the normal relationship of the various parts making up the framework of the nose, and the part played by the nasal septum in the sup-

port of the lower cartilaginous portion. It is well to bear in mind that the anterior edge of the triangular cartilage can be felt directly under the skin, and also that the fleshy tip of the nose is quite mobile, owing to the existence of the membranous septum between it and the lower edge of the triangular cartilage. The existence of this membranous septum makes alteration in the position of the nasal tip a comparatively simple matter.

Preparation of operative field: To guard against any possible infection, great care should be exercised in preparing the interior and exterior of the nose prior to operation.

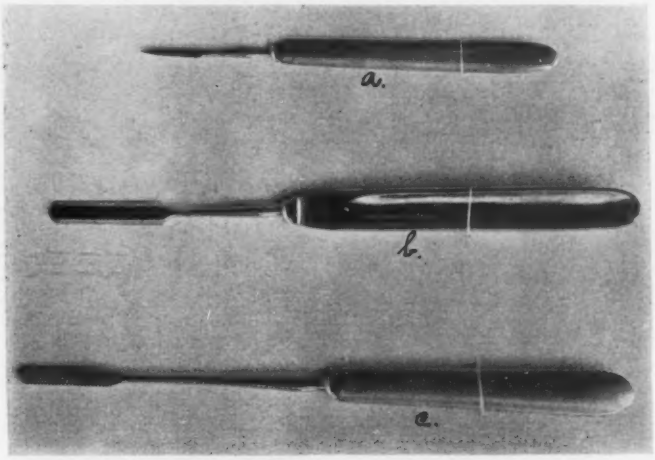

Figure 4. (a) Small pointed knife. (b) Writer's periosteal elevator, end and sides sharp. (c) Writer's file.

After thoroughly douching with a sterile saline solution, the hair is closely cut from within the vestibule of the nose with a pair of long-pointed surgical scissors, and the parts thoroughly washed with pledgets of cotton soaked in 1-2000 bichlorid of mercury solution, followed by 95 per cent alcohol. The entire face is now washed with soap and water, alcohol and ether. Further, to prevent infection when operating in the sitting position, the mouth is covered with a sterile apron made of dental rubber dam. (Figure 3.) This apron also serves to keep blood from running into the mouth of the patient. When operating in the recumbent posture, the mouth is covered with gauze, as the rubber apron would obstruct breathing.

In order that mucus from within the nose may not cause infection, we always enforce mouth-breathing by means of a nasopharyngeal tampon if operating under general anesthesia, or by packing the rear end of both nasal cavities if the patient is in a sitting position, under local anesthesia. Need for this precaution is far greater when operating under ether, which, as a rule, stimulates an excessive flow of mucus and this might be carried into the wound during nasal respiration. Besides, the posterior tampon prevents blood from flowing back into the throat to be aspirated by the patient.

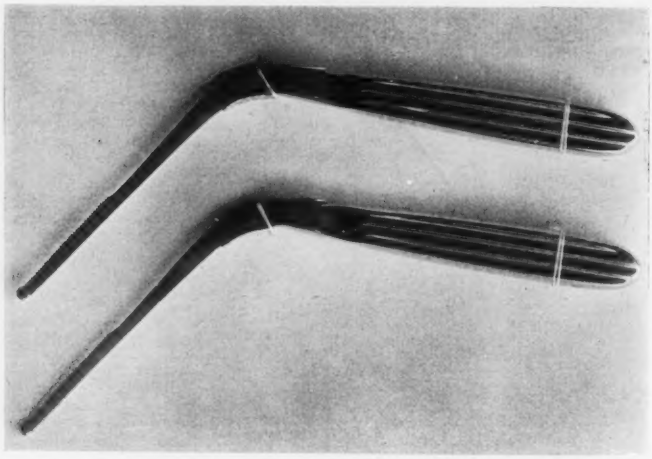

Figure 5. Nasal saws of Coakley, right and left. Part of teeth removed. Blade 1⅝ inches long.

Anesthetic: While in cases of lateral deformity, in which Berens' method of mobilization is employed, ether is administered, in all instances where subcutaneous methods have been followed we have found local anesthesia sufficient, even in subjects as young as 13 years. A preliminary dose of morphia, according to the age of the patient is given hypodermically. The nasal vestibule is cocainized with a 10 per cent solution of cocain, after which the subcutaneous tissue over the entire nose is infiltrated with a one-quarter per cent solution of cocain in 1-15000 adrenalin chlorid. This is best injected with a regular hypodermic syringe, using a special needle 1 to 1½ inches long, according to size of the nose. The needle is inserted from within the vestibule, under the skin, which of course is not to be perforated.

Incision: In all methods of correcting these deformities, the main object should be to avoid marring the subsequent appearance of the nose by scar, or in other words to work entirely from within. For these subcutaneous operations, then, incision, as first advocated by Roe, should be made within the vestibule of the nose, generally above the lower lateral cartilage of the left side, and subsequently if necessary on the right side, cutting through the mucous membrane and the cartilage to the under-surface of the skin. Whether this incision is made close to the septum or more laterally, depends on whether we wish to alter the line of the nasal dorsum only, or whether the nasal processes are to be severed from their attach-

Figure 6. Copper saddle in place after operation.

ment to the superior maxillary. It is surprising with what ease one can, with a very small straight knife (Figure 4a), undermine the skin over the entire nose through a small incision on one side, owing of course to the flexibility of the cartilaginous portion. By following the course of the knife under the skin with the index-finger on the outside, it is not difficult to avoid injury to the skin.

Hemorrhage during this process is not great or annoying, unless one should injure the angular branch of the facial in its course up the side of the nose, embedded in the fibers of the levator labii superioris alaequa nasi muscle. Injury to this vessel may be avoided by working close to the skin while undermining, in this way leaving the muscle attached to the framework of the nose.

In correcting the cartilaginous portion, incision must be made lower down and will be referred to later.

The skin having been undermined, one proceeds with the subsequent steps of the operation, working under the skin as if it were a tent and guiding the movements of the various instruments with the left hand over the outside of the nose.

Hump nose: This is the simplest of these operations. The hump is usually situated at the junction of the osseous and cartilaginous portion of the dorsum nasi. It may be of congenital origin due to overdevelopment of the nose in this situation, or may be acquired through fracture of one or both bones. In consequence of fracture, the

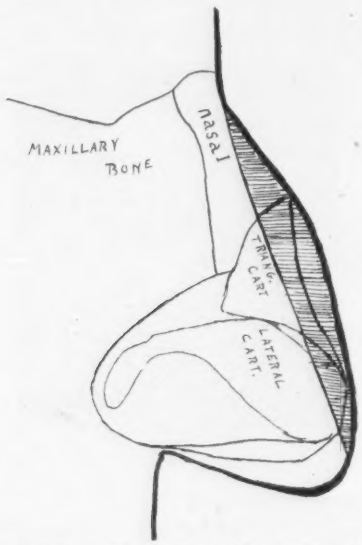

Figure 7. (Schematic.) Dark portion indicating amount of dorsum nasi removed in lowering plane. (Joseph.)

hump may be situated in the middle line or to one side, according to whether both bones were fractured or only one. In this instance also, the hump is generally sharp and the skin over it very sensitive. For removal of hump the skin should be undermined only so far as to permit of freedom in the use of instruments beneath it.

The periosteum over the hump is pushed aside with a small periosteal elevator (Figure 4b). The hump is then sawed off with a short saw (Figure 5), and removed through the incision. A small file (Figure 4c), made for this purpose, is then used to make the surface round and smooth, and the skin is now placed back and

held against the bone by means of a saddle of thin sheet copper, patterned to suit the shape and size of each nose. This saddle first used by Roe in recent fractures is covered with adhesive plaster which not only keeps the copper from direct contact with the tissues but also prevents the edges from cutting into the skin. A one-inch strip of adhesive plaster passing over the saddle and terminating under each ear holds it in place (Figure 6). While the saddle must be snugly fitted and held to the nose, care must be exercised lest the pressure be so great as to interfere with the proper blood-supply of the skin. I might say, before placing the saddle

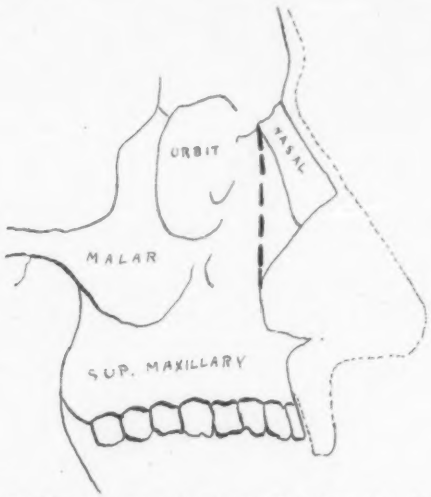

Figure 8. (Schematic.) Dark line indicating direction of saw in severing nasal process to narrow base. (Joseph.)

over the nose, the vestibule is loosely packed with iodoform tape, and that sutures are not necessary in this operation.

There are many advantages of the copper saddle over any other means of retention in all of these subcutaneous operations. First, owing to its flexibility, it can be bent to any desired shape, and the operator is able to make greater or less pressure at any required point along the side of the nose. Secondly, by encasing the nose in such a splint, the extreme swelling which otherwise must follow is prevented without the least danger of constriction. Thirdly, the skin is held down so evenly by it that an accumulation of secretion beneath is impossible. Then also, in working with this soft sheet copper, any ordinary pair of scissors may be used.

In these cases the dressing is changed every forty-eight hours, the interior of the nose douched, and, to prevent maceration, the skin well bathed with alcohol. The saddle should be worn continuously for ten days, after which time, owing to a tendency of the skin to swell, the patient is required to replace the saddle at night for a few weeks longer, but now holding it in place with garter elastic instead of the adhesive plaster.

Reduction of over-sized nose: The over-sized nose, usually of congenital origin, may be simply an exaggerated hump involving

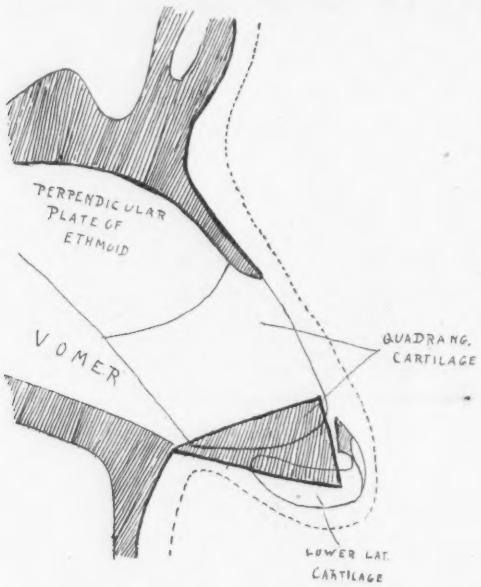

Figure 9. (Schematic.) Triangle removed from lower border of septal cartilage in shortening nose. (Joseph.)

the dorsum of practically the entire nose, or the nose may at the same time be too wide at the base as well as too long, therefore requiring reduction in all directions. It is necessary in this operation to undermine the skin more extensively than in the simple removal of a hump. It must be undermined from the frontal eminence to the tip of the nose, going well down over the nasal processes of the superior maxillary, if the nose is to be narrowed at its base. It is rarely necessary, however, to undermine the skin over the lobule or extreme fleshy tip, nor is it well to routinely undermine over the

furrows of the nasal alae, as an effacement of these furrows is likely to result, making the profile of the nose appear too flat.

In reducing the height of the nose, the method first suggested by Joseph has been followed. After undermining, we saw through the nasal bones from above downward, beginning at the frontal notch, and remove as much of the bony dorsum as required. The cartilaginous portion is pared off with the knife in the same way (Figure 7), and all tissue thus detached is removed through the incision. The file is here also used to smooth and round off the surface. In sawing dorsum of the nose, Roe advises against creating an opening into the nasal chambers, whereas Joseph enters with the saw in nearly all cases. I have not yet seen any infection follow from making such an opening.

After thus lowering the dorsum, the length and width of the nose often appear even more accentuated, and the lobule too prominent. To reduce the width of the nose at the base, both nasal processes are sawed through at their junction with the bodies of the superior maxillary bones (Figure 8), first separating the periosteum with elevator. Now by making firm pressure with the thumb and index-finger, the lower edges may be made to approach the middle line of the nose and the nasal bones fractured at their junction with the frontal. Sometimes, however, to sufficiently mobilize the nasal processes and nasal bones, it is necessary to grasp the bones with forceps, one blade of which is introduced through the incision and the other into the vestibule of the nose.

Should lowering the dorsum cause the top of the nose to appear too broad and flat, this may be overcome by tilting the upper edges of the nasal bones toward the middle line.

Shortening the entire nose, if too long, may be accomplished in the following manner: A triangular piece should be removed horizontally from the lower border of the cartilaginous septum, including a portion of the membranous septum below. The base of this triangle, 3 to 5 mm. in width, should be situated forward directly under the tip of the nose, and the apex at the interior nasal spine (Figure 9). Any small straight knife may be used to transfix the septum for this purpose. After removing the triangular piece, including the mucous membrane on both sides, the tip and columna are sutured to the newly made lower border of the triangular cartilage, thus shortening the septum and raising the tip. It may also be necessary to shorten the lateral walls of the nose by removing horizontally from the inside of each, just above the lower lateral cartilage, a triangular strip including mucous membrane

and cartilage. In closing the wounds thus made with two or three sutures of black silk, the lateral walls are shortened in proportion to the size of the strips removed.

If the cartilaginous portion of the nose is too broad it may be due to a bulging of the alae nasi, which at the same time causes the anterior nasal orifices to appear too large. In several such cases the writer has obtained excellent results by removing a vertical strip from each lower lateral cartilage near the septum, as suggested by Joseph. These strips, 3 to 5 mm. in width, should include everything but the outer skin. To excise these strips, an incision should be made 2 mm. above and parallel with the skin margin just within each ala nasi. Through these incisions the skin

Figure 10. Case 1.
Before operation. After operation.

over the alae is elevated, and with a pair of long-pointed surgical scissors the strips are removed. Suturing of these wounds, which is accomplished with the Yankauer or a small curved surgical needle reduces the breadth of the nose and lowers the tip, at the same time making the opening smaller.

Where the tip of the nose is simply too high, as frequently happens, in the absence of any other deformity, the method of Charles C. Miller for changing the position of the tip will be found simple and effective. This operation consists in transfixing the membranous septum where it joins the triangular cartilage, and in severing the attachment of the entire tip therefrom. Then with several sutures properly placed, the tip may be sewed to the septum in a new position lower down.

Management in these cases after operation is very similar to that mentioned in the after-care of hump nose, that is, the vestibule is packed with iodoform tape and the saddle splint applied. After reducing the size of the nose, the redundant skin should be smoothly held to the dorsum and sides of the nose. This apparent excess of skin soon shrinks and adapts itself to the change in size and position of the nose. The copper saddle is not removed from the nose for four days following operation; thus allowing sufficient time for some union to take place. The vestibule is irrigated with normal salt solution and repacked with iodoform tape, after which the saddle is replaced. Subsequently the dressings are changed every forty-eight hours. Patient is required to wear the splint con-

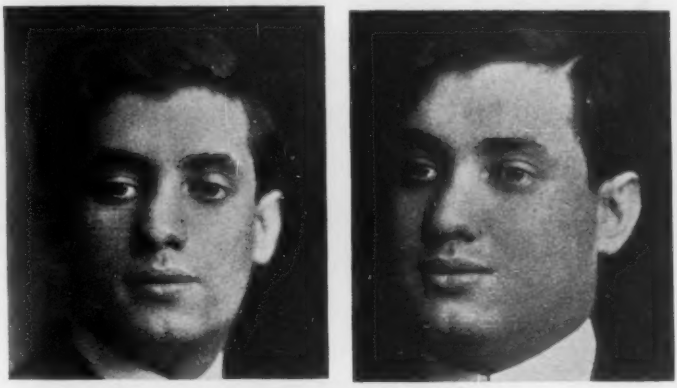

Figure 11. Case 2.
Before operation. After operation.

tinuously for three to five weeks, and at night for several weeks longer.

Where the width of the nose has been reduced at its base, to compress the mobilized nasal processes and prevent them from assuming the old position, several layers of adhesive strips one-quarter inch wide are stuck to the skin along the base of the nose on each side, so that when the copper saddle is placed, firm pressure may be made by the lower portion of the saddle, without injury to the skin.

After shortening the nose, to prevent tension on the stitches, the tip of the nose is supported by a sling made of one-quarter inch strip of adhesive plaster, which passes beneath the tip and is stuck to the skin on each side of the nose near the dorsum.

Local reaction the day after operation may at times be very intense, the lower eyelids being greatly discolored and often so swollen that the eyes cannot be opened. This need cause no alarm, as these local changes quickly subside, leaving scarcely a trace at the end of a week. The general reaction in all cases observed has been too slight to merit consideration.

Lateral deformities: This type of deformity is one for which most frequently relief is sought. It is characterized by a displacement of the nose to one side of the middle line of the face; thus producing a most unsightly appearance. The entire nose is at times bent toward one side. In other instances the bony portion is bent toward one side, while the tip curves in the opposite direction; thus causing the nose to appear twisted. Such a nose presents a very curved dorsal outline, and is usually associated with a marked septal deflection which obstructs nasal breathing. Again a hump or prominence is not uncommon on one side of the nose at the lower end of the nasal bone, making the nose appear very large and broad at this point. In all cases where the entire nose is deflected there is considerable difference in the breadth of the two sides, the side to which the nose is bent being much narrower than the other.

While over-development of the framework on one side of the nose may account for some of these deformities, the vast majority are the results of old unreduced fractures and dislocations.

A satisfactory cosmetic effect in these operations depends upon the free mobilization of the entire bony and cartilaginous framework, the proper placing of the nose in the middle line of the face, and its retention there with some suitable apparatus.

It is generally conceded that nasal breathing should be restored by correcting any existing septal deviation before attempting to operate for the external deformity. Berens corrects both with one operation. Roe and Joseph recommend a preliminary submucous resection in many cases. The writer has not been able to obtain satisfactory results, as far as the septum is concerned, with the Berens method, and is also convinced that a classical submucous resection is not advisable where there is a very marked deflection of the triangular cartilage, for the reason that the removal of a necessary amount of this cartilage often too greatly weakens the support of the nasal tip. Therefore, after undermining the mucous membrane of the septum on both sides, as is done for the regular window resection, I remove only sufficient cartilage from the extreme summit of the deflection to permit an approximation of the

edges of the gap so made, after the septum is straightened. The resiliency of the bent cartilage is further overcome by incisions through it, so placed that when the cartilage is straighened there is no tendency to resume its old curved position.

Any curved condition in the perpendicular plate of the ethmoid may be overcome by cutting partly through it with the Struychen scissors and forcing it toward the middle line with the periosteal elevator. Should the vomer below then be out of alignment, by severing its attachment to the floor of the nose with hammer and chisel, it also can be forced into the middle line. The mucous membrane is now replaced over both sides of the septum, the incision sutured, and both nasal fossae packed in the regular way for

Figure 12. Case 3.
Before operation. After operation.

forty-eight hours. By this procedure we have been able to obtain a perfectly straight septum, and have found, moreover, that the support of the tip was firmer afterward than before operating.

After allowing three or four weeks for healing of the septum, we have proceeded in most cases very much after the method of Berens: Under ether anesthesia, a posterior nasal tampon is introduced, and with the Adams forceps, one blade of which is covered with rubber to protect the skin on the outside of the nose and the other blade introduced within the vestibule of the nose, the nasal bones are grasped, first one and then the other, and fractured at their articulation with each other and with the frontal bone. With these same forceps, minus the rubber covering on the blade, one blade in each nostril, the nasal spine of the frontal is mobilized

and the perpendicular plate of the ethmoid fractured freely just back of the nasal spine. The nasal processes are then separated at their attachment from the body of the superior maxillary bones, with hammer and an ordinary Hajek chisel. Should there still exist any projection or hump on the side of the nose, by placing a chisel handle covered with rubber tubing against it and giving it a smart tap with the hammer, mobilization may be completed.

So much force is at times required in fracturing these bones that, observing the operation, one might suppose the nose was being torn from the face, yet it is indeed surprising to note how trifling is the reaction following. Once sufficiently mobilized, the nose may readily be placed in the middle line and moulded into proper shape, using for the purpose a small dull elevator on the inside and the thumb and index-finger on the outside. The vestibule is then lightly packed with iodoform tape, and the copper saddle placed over the nose. By making tension of the adhesive strip holding the saddle a bit greater on one side than on the other, it is easy to over-correct the displacement somewhat, and this is always advisable.

The saddle is worn continuously for about three weeks, and afterwards at night for a couple of weeks longer. Should the cartilaginous portion of the nose, after healing, appear too broad, the subcutaneous method already indicated may be used to perfect the symmetry four of five weeks later.

Roe and Joseph make use of the saw instead of the hammer and chisel in separating the nasal processes from the superior maxillary, and Joseph, in a number of cases, has found it necessary to resect a strip from the nasal process, on the broad side of the nose so deformed, in order that there may not remain too great an amount of bone on this side to interfere with the retention of the nose in the middle line of the face.

Regarding operation for the correction of deformities known as *saddle* and *pug nose*, the writer is yet unable to furnish any complete report of work done by him, but hopes to do so in the near future in another paper on this subject. We are, however, familiar with reports of Carter, Henle, Roe, Joseph and others, which indicate beyond doubt that cosmetic results obtained in such cases are no less striking or no more impossible than in the class of deformities here referred to.

So far twenty-two deformities of the external nose have been corrected by the writer, with more or less satisfactory results. Of

this number I mention here but five cases, and present photographs showing the appearance in each case before and after operation.

Case 1: Mrs. D., age 33; sharp circumscribed hump about middle of dorsum nasi, in consequence of fracture of both nasal bones sustained while coasting when a young girl. Skin over hump exceedingly sensitive and often inflamed. Patient fearful of the sharp edge cutting through skin.

October 21, 1912, hump removed subcutaneously, under local anesthesia. Saddle worn continuously for ten days, at night for two weeks longer. Pictures showing result taken eight weeks after operation.

Case 2: H. M., male, age 19. Patient poorly nourished and anemic. Right nostril almost completely occluded by deflected sep-

Figure 13. Case 4. Front view.
Before operation. After operation.

tum. Externally the bony portion of the nose inclined markedly to the right, the cartilaginous portion bending to the left. December 10, 1910, nasal obstruction removed by modified submucous operation, which at the same time corrected considerably the curve of the cartilaginous portion.

January 7, 1911, under ether anesthesia, lateral deviation of the bony portion corrected, placing the nose in middle line of face. Three weeks later, under cocain anesthesia, a small strip was removed from each lower lateral cartilage to reduce bulging of the nasal alae.

Picture showing results taken six months after operation, during which time patient gained 20 pounds in weight.

Case 3: I. P., female, age 13. Complained of difficult nasal breathing due to deflected septum and hypertrophied lower turbinates, along with external deformity of the nose. The parents were more concerned, however, about the outer deformity than the obstructed breathing.

July 15, 1913: Attempt was made, under ether anesthesia, to correct the deviated septum and the external deformity at the same time. Result so far as the outside deformity was concerned, was most satisfactory. The septal deflection, though apparently overcome at the time of operation, in a few weeks showed almost as great a bend as before correction.

On August 26, under cocain, a modified submucous resection was performed, both lower turbinates being resected at the same time.

Figure 14. Case 4. Profile of nose.
Before operation. After operation.

Three days later a paracentesis was necessary, owing to an abscess in left ear. This subsided in a week, without further complication. From results in this case, as well as from similar experiences in other cases so operated upon previously, we conclude that in any case it is best to first rid the patient of internal obstruction. Picture showing result taken three months after correction of external deformity.

Case 4: H. H., male, age 13 years. Lateral deformity of bony portion to left, with hump on dorsum and very prominent cartilaginous portion of the nose, following injury six years before. Photographs of the front view and profile of nose show the lateral deformity as well as the hump.

June 29, 1913: Submucous operation performed under cocain.

July 23, 1913: Under ether anesthesia, lateral deformity corrected and nose placed in middle line of face, leaving the hump for correction later.

September 29, 1913: Under cocain, the bony hump was removed with saw and file, and the plane of the cartilaginous portion lowered with the knife, giving results as shown in the two photographs taken six weeks after operation. Since the last photographs were taken, there has been a still further improvement in the appearance of nose, swelling having subsided almost entirely.

Case 5: C. R., male, age 19. Considerably oversized nose, still further deformed through having been struck on the left side of nose by the end of a piece of falling timber two years ago. When

Figure 15. Case 5.

Before operation. After operation.

first seen patient showed a long adherent scar extending from the inner canthus of the eye up the left side of the nose, beyond the middle line of the dorsum. This can be plainly seen on photograph.

In addition, the lower edge of the left nasal bone had been driven inward, resulting in a marked depression below it. The upper edge was turned outward, standing as a sharp ledge under the skin near the dorsum which appeared very broad and flat. The cartilaginous portion stood out very prominently and the tip was unusually large.

September 22, 1913: Under local anesthesia, the sharp ledge on the left side of nose was sawed off subcutaneously and turned

down into the depression below. The attachment of the nasal processes to the superior maxillary were sawed through and the nasal bones mobilized, so that by compressing them the base of the nose was narrowed. At the same time a 4 mm. strip of cartilage and mucous membrane were removed from the cartilaginous portion of the nose near the septum. These strips included portions of the lower lateral cartilages, and tapered to a point about one-half cm. above these, so that the entire cartilaginous portion was narrowed and the bulging tip reduced. Edges of the wounds within the vestibule of the nose were drawn together with three silk sutures, and after packing the nose, saddle applied.

Saddle was worn continuously until October 18, when patient returned to home in West Virginia with instruction to wear the saddle each night for three or four weeks longer.

Picture showing result was taken October 18, not quite one month after operation.

In this case not only was the bony deformity in consequence of the fracture corrected, but the entire nose was reduced in size, and the conspicuous scar could hardly be seen at all after being detached from the bone to which it was adherent.

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New Contribution to the Study of Chronic Lacunar Tonsillitis.

G. ROYET. *Revue hebd. de Laryngol.*, Feb. 28, 1914.

Royet calls attention to certain patients who complain of an irregular and apparently incurable discomfort of the throat which may be felt in the act of swallowing food or even of the saliva only. The tonsil in such cases may appear normal or even atrophied, but a careful examination shows a chronic inflammation of the crypt of the tonsil, usually accompanied by retention of its secretion. In the cases enumerated, a cure was obtained by ablation of the lobe of the tonsil involved, followed by the application of a strong solution of chlorid of zinc.

SCHEPPEGRELL.

HISTO-PATHOLOGY OF THE FAUCIAL TONSIL.

DR. T. E. CARMODY, Denver.

Of the lymphatic structures of the body which undergo pathological change the faucial tonsil is probably the most frequently affected, next the vermiform appendix, and third the pharyngeal tonsil.

The relation of the lymphoid structures in the upper respiratory tract is better understood if we first note their development. The order of development and retrogression of the lymphatic structures is pharyngeal tonsil, faucial tonsil, lingual tonsil and laryngeal tonsil.

The pharyngeal, which is found in the lower form of life as in reptiles and birds, makes its appearance in man probably about the fifth or sixth week of fetal life. G. Killian has shown this tonsil to be associated in the development with the vestigial space known as the bursa pharyngea embryonalis.

The origin of this bursa is not known, but Linck states that in its pure form it belongs entirely to the embryonic life; it is also posterior and independent of Rathke's pouch, and Patterson warns especially against confusing it with the bursa pharyngea of Schwabach, which is simply a space in the center of the pharyngeal tonsil, produced chiefly by pathological changes, and frequently persisting into adult life. The pharyngeal tonsil probably has very little, if any, function after the first year of extra-uterine life.

The faucial or palatal tonsil appears in the fetus somewhat later, probably about the seventh or eighth week or possibly even earlier. It is developed from the second gill cleft. In embryos of four or five months the shallow pouch which represents this cleft is found bounded in part by the arcus palato-glossus which is a survival of the second branchial arch. It is partly covered by the uvula, and is continued on to the wall of the pharynx as a fold, the plica triangularis of His. This forms the dorsal boundary of the pouch. The pouch is lined with mucous membrane continuous with that of the pharynx.

About the third month, according to Stohr, the tonsil is composed of stratified epithelium resting on the mesenchyne without leucocytes; at about the fourth month (McMurrich) solid buds begin to grow from the epithelium into the subjacent mesenchyne and depressions appear on the surface of this region. Later the buds become hollow by a contraction and cornification of their

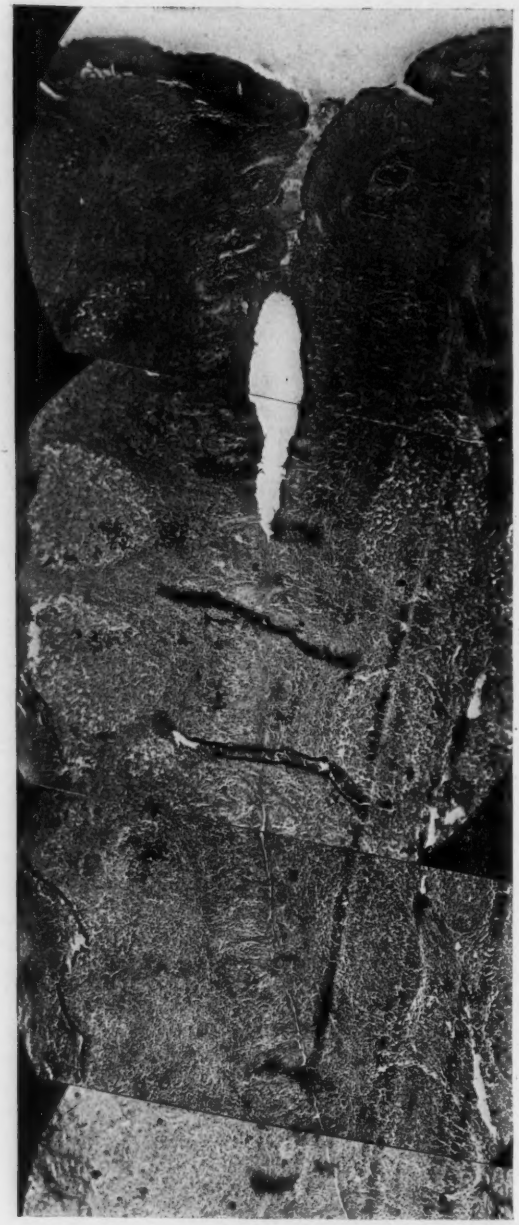

Figure 1. Crypt with plug protruding, also dilated space below surface with absence of epithelium. Remainder of crypt normal except lack of epithelium in places.

central cells. These spaces later communicate with the depressions to form the crypts.

During this period the lymphocytes collected in the mesenchyne congregate in small numbers to form the lymph follicles. Whether the lymphocytes are derived from the epithelium or from the blood vessels is as yet a disputed point.

Although the tonsil may, because of the pathological conditions, completely fill the fossa it usually leaves a space, the supra-tonsilla fossa above, which represents the remains of the second branchial furrow. Rosenmueller's groove or fossa is also a remains of this furrow.

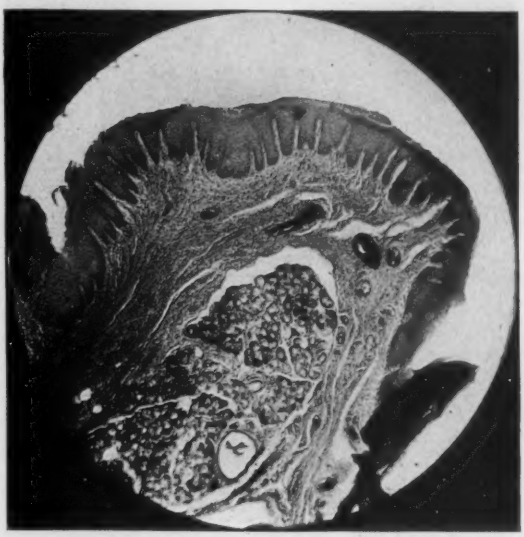

Figure 2. Epithelium with connective tissue columns. Adenoid tissue within connective tissue. From patient, aged 6 years.

The faucial tonsil resembles the lymph glands more closely than any of the other lymphoid tissues in shape and structure, having a capsule although not complete, fibrous trabeculae, adenoid nests and a richly supply of lymph vessels and lymph spaces.

It is so placed that it can be hypertrophied without making pressure upon any bony structure although the mandible is sometimes thrown forward, giving a prognathous appearance, to relieve pressure on the inflamed tissue, especially in acute inflammatory conditions, although it may also be found frequently in chronic.

The pharyngeal, on the other hand, has a bony base and must necessarily hypertrophy downward and forward, while the lin-

gual tonsil hypertrophies upward and backward as it cannot penetrate the fibrous tissue which might be called a capsule overlying the muscular tissue of the base of the tongue.

The faucial tonsil looses its function somewhere between the second and seventh year. The lingual tonsil appears about the fourth month and is developed by the laying down of round cells around mucous glands at the base of the tongue. Later, about the eighth month, these round cells are also found in the connective tissue surrounding these glands. With the lingual tonsil as with

Figure 3. Markedly thickened capsule. Connective tissue has replaced adenoid tissue in this tonsil.

the faucial it is a question at what age it ceases to functionate, but probably about the fifteenth year.

The laryngeal tonsil, as it is sometimes called, is simply the vestigial remains of the air sac found in anthropoid apes, and is known as the appendix of the ventricle of the larynx. It is stated by Citelli that this organ is not found in the human fetus but makes its appearance between the third and fourth years of life. It probably functionates about the thirtieth year, when retrogression takes place, which is not completed until the fiftieth year.

It will be seen by the foregoing that while we have all these lymphoid structures their periods of activity are not coincident but successive or slightly overlapping, and while the pharyngeal

is retrogressing and probably also the faucial, the lingual and laryngeal are reaching the height of activity and beginning development respectively.

The faucial tonsil in its primitive form is simply a lymphoid lining of the furrow (fossa tonsillaris) remaining from the second branchial arch; as we pass to the higher forms (rabbit) we find this tissue as a single nodule. It becomes larger and more specialized as we ascend in type—ox, sheep, etc., and we find an attempt to divide into lobes which, according to Hammar, is the normal condition in man during development, although later the septum dis-

Figure 4. Degenerated area in tonsil. Necrotic tissue abscess.

appears and the lobes blend. This latter condition he states as representing full development, but it would seem to be a step toward retrogression. These lobes are at times blended only at the base, as the throat surgeon finds in some cases when, on removal of the instrument with enucleated mass, he simply has one lobe, usually the superior.

The superior lobe has attained, according to Patterson, its full growth at birth, while the inferior lobe may increase in size. Thus J. Killian states that a hypertrophied tonsil at the end of the first year is composed entirely of middle and inferior portions. Although this may be true at the end of the first year, as I cannot contradict from experience, it is certainly not true from the third

year on as the superior lobe is, in most cases, much larger than the inferior.

The epithelial covering of the tonsil is of the stratified variety, as is that lining the crypts. We have found the lining of the crypts deficient in many cases, and have drawn the conclusion that in breaking through the cornified cells from the center of the developing tonsil to the depressions on the surface, small areas are left which are devoid of epithelium and do not receive the covering. It has been furthermore noted that there are no glands in the tissue underlying these areas. It may be said that the epithelium has been destroyed by infection, pressure of necrotic plug, etc., but the latter at least would not be applicable to the younger cases, as you do not find caseous masses in the tonsils of young children, and only superficial plugs in cases of acute infection.

In adults we frequently find plugs in the crypts composed of leucocytes, epithelium bacteria and disorganized tissue. We may question why these masses are retained in the crypts. The explanation given by most authors is that of closure of the mouth of the crypts and has been treated by slitting the crypt, cauterizing deeply into the crypt so as to obliterate, etc.

This explanation is not sufficient, for many of us have seen these masses protruding from the opening and yet they are not expelled, so, while not denying this, we believe that the lack of mucus to lubricate the crypt walls accounts in a large degree for it, and furthermore that the plug resembling a scab clings to the tissue devoid of an epithelial covering as it does in the nose, on the skin and elsewhere when it is not brushed off. (Figure 1.)

We must not forget that hypertrophy of the muscular tissue in the pillars and overlying the crypt openings may prevent the plug being expelled from even a normal crypt.

It is well known that this plugged condition of the superior crypt of the tonsil opening into the supra-tonsillar fossa is a great source of trouble, and the cause of probably 95 per cent to 98 per cent of all peritonsillar abscesses. The drainage of the crypts in the inferior lobe and the most inferior of those in the superior is favored by gravity and negative pressure during the act of swallowing.

We have also known for some time that removal of the upper lobe is sufficient to allow the remainder of the tonsil to return to normal in the great majority of cases. We furthermore have observed and have recently had our attention called by Sluder to the

fact that the adenoid tissue from the lingual tonsil migrates into the fossa tonsillaris after complete removal.

As regards the effect of pathological conditions of the tonsil upon the general health it is easily understood after examination of a number of diseased organs, and considering the drainage of the lymph vessels of the tonsil and those of the base of the tongue which drain the lingual tonsil into the superior deep cervical chain of glands.

Although our investigations have just commenced we have noted a number of changes in the tonsil, its capsule, etc., most of which have been found by other observers. Thus far only thirty-five pairs of tonsils have been completely examined, although we had expected to have a very much larger number to report at this time. The ages of the patients vary from 2½ to 28 years. The majority of the tonsils were removed by the modified Sluder method, although several were removed with the knife and snare: most of them had not been operated before; three, however, had had tonsillotomy performed.

They were removed for various reasons: First, repeated attacks of follicular tonsillitis with glandular enlargement being most common; next, rheumatism associated with attacks of tonsillitis, endocarditis, and, in one case, anemia, the cause of which seemed to be diseased faucial and pharyngeal tonsils.

On examination we found destruction of the epithelium upon the surface and in the crypts. In the cases which had previously had tonsillotomy performed it was found that there had been no regeneration.

The older the patient the less adenoid tissue and the more connective tissue. The greater the number of attacks of tonsillitis or abscesses, the greater the amount of connective tissue. (Figure 3).

Abscesses within the tonsil (Figure 4) were found in two cases, one of which had been running fever for months, but had cleared up entirely since operation.

Diplococci and streptococci were found in all cases examined No tubercle bacilli were found and no other evidence of tuberculosis.

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THE TREATMENT OF ACCIDENTAL WOUNDS OF THE DURA DURING OPERATIONS UPON THE MASTOID PROCESS.*

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While wounding of the lateral sinus occasionally occurs in operations upon the mastoid, wounds of the dura in the middle cranial fossa are comparatively rare—at least if we are to judge from cases reported. While I have not searched the literature thoroughly, I have been fairly conversant with otological literature for the past twenty-five years, but I do not remember seeing in print any article dealing with this particular subject.

The paper in question, therefore, is based entirely upon my own personal experience and consists of a series of cases in which, during the performance of the radical operation, unintentional entrance of the subdural space occurred. It is impossible to say in some of these cases whether actual healthy dura was perforated at the time of the operation or whether the instruments passed through a previously necrotic area. In certain of the cases it seemed to me that the dura must have been necrotic at the point of perforation. In other cases, I am certain that the dura was healthy and that the opening of the subdural space occurred through healthy dura, uninvaded by any previous pathological process. Each case will be briefly detailed and the conclusions drawn:

Case 1: A young adult, with a history of chronic suppuration, presented herself at the New York Eye and Ear Infirmary, and the radical operation was advised for the relief of this condition. The antrum was small and in attempting to enter it with a small gouge I found that the dura had been perforated. On enlarging the wound, the dura looked unhealthy and I was inclined to believe that the dura had been necrotic at this point, although, naturally, this could not be absolutely proved. The radical operation was completed, a narrow strip of iodoform gauze carried into the dural opening, the radical cavity packed off with iodoform gauze, and the posterior wound sutured. This patient had no untoward symptoms and made a complete recovery.

Case 2: Male, about 20 years of age, suffered from a chronic suppurative otitis media. The radical operation was advised for the relief of this condition. On removing the external wall of the

*Read at the forty-seventh annual meeting of the American Otological Society, Atlantic City, May 28, 1914.

tympanic vault the dura was perforated accidentally, on account of the fact that the middle cranial fossa lay exceedingly low in this patient. I was so confident that the external wall of the attic alone had been removed that I passed a probe inward, expecting to find the internal bony wall of the attic, instead of which my probe entered the brain substance. This patient had never had any previous cerebral symptoms, and as the experience occurred in the earlier years of my practice I was naturally greatly disturbed. The opening in the dura was packed off by a strip of iodoform gauze, the radical operation was completed in the ordinary manner, great care being taken to do a complete and thorough operation. The usual meatal flap was cut, and then the area of wounded dura was thoroughly exposed by the removal of the bony wall in every direction. A strip of iodoform gauze was carried just within the margins of the dural wound and was brought out of the external auditory meatus. The radical cavity was packed with a second piece of iodoform gauze and the posterior wound sutured. Absolutely no untoward symptoms followed. The gauze from the radical cavity was removed on the second or third day and replaced. The gauze in the dural wound was allowed to remain in position for four or five days, when it was removed and carefully replaced through the meatus. Absolutely no untoward symptoms supervened in this case. The patient made a perfect recovery, and was under observation for a number of years after the operation. His suppuration was entirely relieved, and during the period of his convalescence as well as subsequently no cerebral symptoms developed.

Case 3: Male, about 40 years of age, suffering from chronic middle-ear suppuration, of long duration. The antrum was located high up, and was small. In attempting to enter the antrum a small, narrow gouge was used, and when the antrum had been supposedly entered I found a probe passed without resistance for a considerable distance. In other words, I knew that the probe had entered the brain substance. The bony wall around this opening was rapidly broken down by means of the gouge and the dura was found to look suspicious. I believe, in this case, that there had been a necrosis of the dura at this point, although I cannot be certain of this. The radical operation was completed, a small strip of iodoform gauze inserted through the dural opening, the radical cavity packed with iodoform gauze, and a third strip of iodoform gauze inserted between the packing entering the dural opening and that filling the radical cavity. The ordinary meatal flap was formed and the posterior wound sutured. This patient never had

a rise of temperature and never experienced any untoward effect. Ten days after the first operation the posterior wound was reopened and the entire cavity was grafted by means of a Thiersch graft. The patient made an uninterrupted recovery. It is now ten years since this operation, the patient is in perfect health, and has never suffered from any cerebral symptoms.

I omit here two cases of similar conditions found at operation, where, in one case, the dura had been accidentally opened by another operator, and a brain abscess was found later. Also, a second case, in which an eroded area of dura was found at the time of operation, leading into the brain abscess. Both of these cases have been reported in the series of cases of brain abscess presented by me at the International Otological Congress, in Boston, in 1912. One of these patients recovered completely, and the other died after being fairly well for a period of over three months. As these histories have all been published, I will not go into details here regarding them.

Case 4: A woman, between 30 and 40 years of age, presented herself at the New York Eye and Ear Infirmary, with symptoms of an acute mastoiditis. There were indefinite cerebral symptoms. The patient was immediately operated upon. The mastoid was found to be small, the inner table carious and the dura was entered with the curette. I believe here that the dura was necrotic, as every precaution was taken at the time of operation and it does not seem to me that an accidental wounding of healthy dura could have occurred in this case. The patient developed symptoms of meningitis, and in spite of operative interference died as the result of meningeal infection.

Case 5: The patient was a young man, who came to the New York Eye and Ear Infirmary over two years ago, suffering from a chronic suppurative otitis media for which the radical operation was advised. In this case the dura was accidentally entered. The bony margin surrounding the dural opening was removed in every direction, so as to expose a large area of dura. The dura was then opened by two right-angle incisions, about one-half inch in length, crossing each other. Iodoform gauze was lightly packed into the dural opening after the completion of the radical operation. This patient had a slight fever immediately after the operation; the temperature, however, never rose above 102°, and gradually sank to between 99° and 100°. He complained of slight headache but of no other symptoms. The posterior wound was not completely closed in this case, the dural packing being brought out through

the posterior opening. The patient was observed carefully and about ten days after the operation, showed, on examination by a prominent ophthalmologist of this city, a definite elevation of the optic papilla, on the operated side. I might say that the patient was also examined by another ophthalmogist who found no elevation beyond the physiological limit. I explained to my consultant that further operative procedure, in this case, would depend upon his decision. In other words, I had no other evidence of superficial brain abscess than that which would be afforded me by a beginning optic neuritis. The ophthalmologist saw this patient several times, and gave the absolute opinion that there was a slowly increasing swelling of the optic papilla upon the affected side. I, therefore, advised exploration of the wound, believing that I should be able to evacuate a superficial brain abscess. The patient absolutely refused operation and was therefore compelled to leave the hospital. He disappeared from observation, but I learned subsequently from one of my hospital internes that at least a year after the operation he was perfectly well. In other words, he made a complete recovery, and the slight optic neuritis from which he was supposed to suffer was probably an error in diagnosis.

Case 6: A young woman, suffering from a chronic suppurative otitis media, was advised to undergo the radical operation. The middle cranial fossa was very low in this case, and on removing the floor of the middle fossa, a small spicule of bone must have penetrated the dura. The dura was perfectly healthy in this case. The area of dural exposure was enlarged, and the dural opening was also enlarged by two crossed incisions at right-angles to each other. An iodoform gauze packing was introduced through the dural opening and the radical cavity was packed off with iodoform gauze, in the usual way. A third strip of gauze was inserted between the gauze draining the subdural space and that filling the radical cavity. The posterior wound was completely closed. A dressing was made on the third day after the operation and on removing the gauze packing from the subdural space about a quarter of a teaspoonful of softened brain tissue escaped. The patient was anesthetized, the posterior wound opened, and this localized necrotic area in the brain substance packed off with iodoform gauze. The radical cavity was also packed with iodoform gauze. and a third strip of gauze carried between these two packings so as to separate them. This patient made an absolutely uninterrupted recovery.

I have been led to report these cases because they seem to demonstrate that even accidental opening of the dura, at the time of the radical operation, is not necessarily followed by severe sequelae, provided the operator is careful to preserve perfect technic during the operation, and to do a complete operation, even although necrotic dura may be found or an accidental opening of healthy dura occur in the early stages of the operative procedure.

I believe that the favorable termination in all of these cases was due simply to the fact that perfect asepsis was maintained during the entire operation. The wounded dura was meddled with as little as possible and as soon as it was found that the dura had been opened a packing was placed over this opening, so as to prevent the entrance of any infectious material during the remainder of the operation. Great care was taken in these cases to make the operation particularly thorough, and to see that no focus of infection remained in the middle ear.

From the report of the cases it seems practically immaterial whether or not the original opening made in the dura be enlarged. In other words, my earlier cases, in which the small opening in the dura was simply occluded with a plug of iodoform gauze recovered as completely as did the later cases, in which the dura was more freely opened by crossed incisions, at right-angles to each other.

I believe, however, that in these cases the proper plan of procedure is to first remove the overlying bone about the wounded dural area over a considerable extent, in order to expose a large area of dura. I believe then, after every trace of disease has been cleared from the tympanic cavity, that the dural opening should be enlarged by two crossed incisions. Iodoform gauze should now be rather firmly packed into this opening, with the idea of causing sufficient pressure to secure an amalgamation of the cerebral membranes immediately about the wounded area. In this way general meningeal infection will be avoided. If an acute cerebritis occurs and this, of course, is a danger always to be thought of—the infected area will be freely drained and the danger of extension of the cerebritis will be very remote. This is the plan of procedure which I have followed in my later cases, and it seems to be entirely satisfactory.

It will be noted that in only one instance did death follow this accident, and that was in a case of acute mastoiditis with probable meningeal involvement before operation.

I have hesitated to present a paper of this kind, because no one appreciates more keenly than do I the actual danger of dural wounds during the course of operations upon the tympano-mastoid tract. I have presented it, however, because it seems to me that it is time some definite plan of treatment should be formulated for accidents of this kind, as they must occur to every operator of large experience. I do not wish to minimize the gravity of these accidents but simply to present a definite plan of procedure which, in my hands, has proved most successful in combating them.

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Case of Acute Hypertrophic Tonsillar Adenitis. AMEDEE PUGNAT. *Revue hebd. de Laryngol,* April 11, 1914.

Moure reports two interesting cases of acute hypertrophy of the tonsils in children in whom a complete removal of the hypertrophied tonsils had been performed. In these cases, there developed a real acute tonsillar adenoiditis accompanied by fever and submaxillary adenoiditis. When the inflammation had subsided, there remained in one case on one side and in the other on both, extremely large tonsils obstructing the fauces and necessitating a second operation.

SCHEPPEGRELL.

Contribution to an International Inquiry on Ozena. J. DUVERGER. *Revue hebd. de Laryngol,* April 25, 1914.

From an examination of a large number of persons of both sexes and all ages, Duverger finds that ozena is very rare in the Arabian race, and this in spite of the fact that the Arabs herd together in large numbers, it being not uncommon for six to eight individuals to be in the same room not counting the children. As animals, however, are never allowed to come into the houses, as is common elsewhere, and Arabs never approach a dog to fondle it, the author suggests that this may be a strong argument in favor of the canine theory of Perez.

SCHEPPEGRELL.

ANESTHESIA IN AURAL SURGERY.

DR. WM. GUY DORAN, New York City.

The question of anesthesia in aural surgery needs no introduction to those familiar with operations about the mouth and pharynx and the surgeon who encounters such cases must of necessity feel the relative importance of its administration.

While we cannot boast of an ideal method of anesthesia in aural cases, we can, by earnest efforts properly directed, look forward with confidence to a satisfactory solution of the problem. Many valuable suggestions have come to us from the surgeons engaged in such operations but the field of anesthesia has become so important in our present day that it requires the undivided attention of those engaged in this work. It logically follows that we look to the anesthetist to offer the suggestions that may be of assistance in this regard; and it is hoped that the method here described may be a step forward and that some of the features will prove of assistance to those engaged in this work.

The skilled anesthetist fulfills a conscientious duty to the patient and to the surgeon and it is his earnest effort to perform his duties to each to the best of his ability. His greatest aim is to carry the patient through the anesthetic with the least amount of shock and to reduce to a minimum the post-operative distress that is so frequent after a prolonged anesthesia. This can only be accomplished by the administration of a uniform anesthesia of sufficient depth to carry the patient along the "border line" of complete narcosis, and to avoid as much as possible the interrupted anesthesia that is so wearing on the patient. He must be an assistance to the surgeon and not a hindrance. The field of sterility in aural cases must be preserved with the same care as in an abdominal operation The anesthetist should be scrubbed and gowned in all cases where he is likely to come in contact with the operator or his implements, and the sterile linen about the head of the patient should be kept free from contamination by the anesthetist. The method of anesthesia that is adapted should be carefully planned so as to avoid any interference with the movements of the operator and to leave him the greater area of the field in which to work. To accomplish this, the anesthetist must have the necessary equipments, and the method of procedure should be planned to meet each individual

case. This might seem a difficult task to many, but in the cases at St. Vincent's Hospital we have found it a great advantage to consider the difficulties in aural cases and to attempt to eliminate them wherever possible by improving the method of anesthesia; and with the kind of co-operation of the attending surgeons I have been afforded ample opportunity to apply these principles in the cases that are best adapted for its use.

The patient receives the usual preparation for the operation in regard to rest, the bowels and diet. He should be insured a good night's rest preceding the operation, and one hour before going to the operating room a quarter grain of morphin and one one-hundred fiftieth of a grain of atropin should be given. The preliminary anesthetic of choice is gas-ether, which is continued until a degree of anesthesia sufficient to abolish the conjunctival reflexes is obtained. The patient is then placed on the operating table or chair, as the operator may desire, the face-mask is removed, and the anesthesia for the remaining period of the operation is maintained by our present method, which comprises the following features: 1. Illuminated, hollow, tongue-depressor. 2. Ether vapor machine. 3. Aspirator.

The tongue depressor embodies three distinct features: (a) It serves as an instrument during the operation and thereby reduces the number of instruments in the mouth. (b) It allows for the passage of ether vapor. (c) It illuminates the pharynx. It is the instrument of choice because it is more constantly used than any other, and for the greater part of the operation is within the pharynx. It is also of great aid in keeping the tongue depressed and prevents an obstruction to the respired air. The ether vapor is passed through the instrument to the base of the pharynx, where it meets the tidal air from the nasal and aural cavities. Here an atmosphere of warm ether vapor of any desired percentage can be created. The instrument (here illustrated) consists of a hollow lingual portion and a handle which is set at right angles to the body of the instrument. The material used is sheet metal, sufficiently strong to withstand a great strain. The lingual portion is hollow to permit the passage of the ether vapor and to direct it downward towards the pharynx. The small lamp which affords the illumination is set in a depression on the lingual portion well down near the tip and is protected with a transparent film of fiberloid, which insures safety against an accident to the lamp. A two-volt lamp is set into a detachable rod that traverses the entire length of the lingual portion of the instrument, and enables one to sterilize

the instrument by boiling and to replace a small lamp without delay. The handle of the instrument is hollow and contains a two cell battery capable of a continuous illumination for several hours.

In certain cases we find it necessary to substitute for the tongue-depressor a laryngeal speculum (here illustrated) of the accepted design, but made with the added features for illumination and for ether vapor. These parts are interchangeable on the one handle and are connected with a threaded joint of standard size so that they may be quickly changed whenever it becomes necessary. The use of the illuminated tongue-depressor for anesthesia has greatly fa-

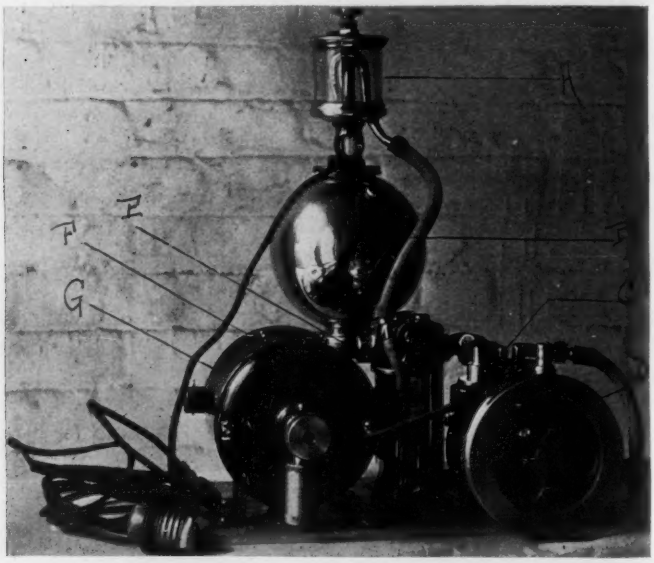


Figure 1. Ether vapor machine. (A) Ether cup. (B) Ether vaporizer and vacuum sphere. (C) Aspirator. (D) Rotary Blower. (E) Air filter and stabilizer. (F) Mercurial manometer. (G) Universal motor.

cilitated our work in many respects. The actual time of the operation is shortened; the anesthetist may serve as an assistant to the operator, as well as administer the anesthetic; the field of operation is well illuminated by the rays of light from the lamp, which are directed upward and backward into the nasal and aural cavities; and of still greater advantage is the clear field of operation afforded the surgeon without his having to share his limited space with the anesthetist.

The second unit consisting of the ether vaporizer is a mechanical device of my own which produces a mixture of air and ether of any desired percentage, warms it to the body temperature and allows for the determination of air volume and pressure. It consists of a rotary blower, a motor, an air filter and stabilizer, an ether cup, and a vacuum sphere containing an electric heater surrounded by a coil of copper tubing. As the air leaves the rotary blower it is passed through an air filter and stabilizer where foreign particles are removed and the flow of air made more constant. A mercurial manometer attached to the stabilizer indicates the air pressure. It then passes into a coil of copper tubing that sur-

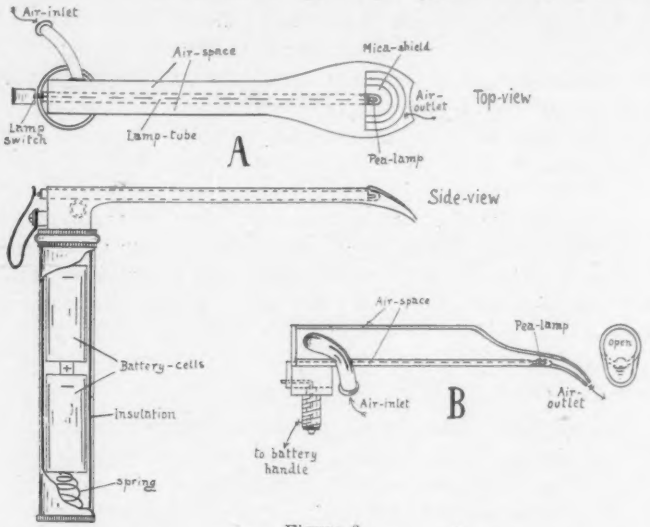


Figure 2.

rounds an electric heater, and both heater and coil are inserted in a vacuum-lined sphere. The vacuum sphere retains the heat around the coil and also serves as a reservoir for boiling water when electricity is not available. The ether is introduced into the air current from a drop cup before it enters the copper coil and in its passage through the warm coil it is completely vaporized and then allowed to flow through a rubber tube to the illuminated tongue-depressor and thence to the pharynx. The volume of the air passing through the vaporizer may be varied by changing the speed of the motor. The rotary motor that I have adopted is capable of deliverying 20 liters a minute, which is greater than the amount required since the patient takes the normal amount through the

mouth and nose with each inspiration; hence it is unnecessary to deliver through the machine more air than is required to carry the ether vapor to the pharynx. The approximate strength of the ether vapor can be determined by allowing a known amount of ether to drop into a uniform volume of air passing through the machine each minute and to a degree an absolutely uniform anesthesia may be maintained.

The third feature of the method, and one that has proved to be of great assistance in the cases of aural surgery, is the aspirator. In the cases that are operated on in the erect position, the blood and mucus that fall into the posterior pharynx are often very annoying to care for, because of the great difficulty in breathing, and of the possibility of developing a case of pneumonia directly due to the aspiration of septic mucus or blood into the trachea. The aspirator is attached to the inlet valve of the rotary blower and consists of a glass jar with air-tight connections, one attached to the blower and the other to a tube leading to the patient. The mucus and blood that gather in the pharynx are sucked into the tube and carried to the glass bottle or jar where they are deposited and accumulate in the bottom of the receptacle until the operation is completed. This feature of the machine was of great service in tonsillectomies and adenectomies that were treated in the erect posture. The entire field of operation is completely exposed to view and illuminated, thereby giving the operator a chance to make a clean enucleation and to keep the field clean and dry.

This combination has served us with success in the cases thus far, and we have every reason to believe that it will continue to be of assistance. The ease with which the machine can be operated makes it a safe practice even in the hands of the interne; and the weight of the machine, which, all told, is not over fifteen pounds, will make it useful to one who wishes to operate in the home with the same degree of safety as in the hospital. All these features may not be applied in every case, but as the occasion demands we can change the method slightly to meet the requirements of the particular case. The laryngeal speculum, the tongue-depressor, the nasal catheter or the intra-tracheal catheter, may be used as the occasion demands; and in the event of not having electricity for power we can use a foot bellows and boiling water in the vacuum sphere with equal success.

The advantage of the method may be summarized as follows: 1. Shortens the duration of the operation. 2. Diminishes the

shock to the patient by permitting a shorter, lighter and more uniform anesthesia. 3. Lessens the post-operative distress. 4. Lessens the secretions in the mouth. 5. Respirations are not obstructive. 6. Lessens the possibility of bronchitis and pneumonia. 7. Illumination of the pharynx permits of a more complete view of the operation and does away with the inconvenience of a head-mirror and the electric attachments. 8. Aspiration of blood and mucus keeps the throat clear and enables one to control hemorrhage easily. 9. Gives the surgeon complete control of the operative field and does not interfere with the sterility of the operation.

61 Hamilton Place.

A Rare Case of Exclusive Localization of the Fuso-Spirillar Symbiosis. R. GEZES, *Rev. hebd. de Laryngol.*, March 28, 1914.

The patient, a woman of 22, developed difficulties in swallowing and breathing and great pain. A laryngoscopic examination was difficult on account of the marked swelling of the fauces. The region of the lingual tonsil was entirely covered with a pale pseudo-membrane, the whole lymphoid region presenting marked inflammation. The hypertrophied lingual follicles were congested and slightly ulcerated. The action of the arytenoids was normal and the vocal cords were only slightly inflamed.

A bacteriological examination showed much epidermic detritus in the midst of which were found numerous cocci, staphylococci, bacilli ramosus, spirilla and fusiform bacilli. The patient recovered after twelve days, the treatment consisting principally of insufflation of potash and irrigations of boro-oxygenated water.

The diagnosis of this condition from diphtheria presents some difficulty but the following points will assist: The temperature is higher than in diphtheria; the inflammatory process is more limited and with less involvement of the adjoining regions. The fetor is characteristic of the fuso-spirillar infection; the bacteriologic examination, however, is the distinctive factor in the diagnosis.

SCHEPPEGRELL.

ASEPSIS IN OFFICE PRACTICE.

DR. CLAUDE G. CRANE, Brooklyn, N. Y.

Careful asepsis in office practice is just as urgent as in the operating room. In the operating room every one unconsciously observes the strictest asepsis. Is this true of office practice?

The man doing internal medicine should have this in mind, but it is the specialist who needs to be particularly observant of office asepsis, because he deals so largely with the class of cases that have foci of active infection.

The ear, nose and throat man should never relax his vigilance. For the past few years I have been taking a great many cultures of all classes of ear, nose and throat cases, for the purpose of diagnosis and vaccine therapy. There have been few cases, in which

a culture taken with the platinum loop, has not shown an active growth of pathogenic bacteria. Every patient is entitled to protection from the infection of every other patient. The electric sterilizer is a valuable asset because it can be placed where all instruments used in examinations, treatments and operations can be dropped in. The use of strong antiseptic solutions does not take the place of sterilization. Rubber gloves also serve us well in the office as in the hospital, and sterile dressings are easily attainable.

One thing in the office of the ear, nose and throat man which is far below the standard of surgical asepsis is the cotton container. All our efforts to be surgically clean are futile with the present

cotton container. Every one is familiar with the various forms now in use, and must realize that they are a source of infection from one patient to another. They stand with cotton exposed hour after hour, and the repeated extraction of cotton with one's fingers from this open container is so contrary to our idea of surgical asepsis that one wonders that it has been used year after year.

For some time I have been trying to devise a container for sterile cotton which would be practical in a busy office. The one which I wish to show you to-night (see cut) I have found, after a period of daily use, to fulfill the purpose. The stand is very heavy which makes the extraction of cotton with one hand possible and easy. The bottles containing the sterilized cotton, are made without an inside shoulder, so that the spring can push up the cotton as needed. The opening in the top is star-shaped, and a cap which effectually seals the container fits tightly over this. The stand holds six bottles but it is necessary to have a sufficient number of containers, so that a new one may be used for each patient. There are two methods of sterilization; the empty containers may be sterilized and then filled with sterile cotton, or the container may be filled and then sterilized. Soda must not be used in the water in which the container is sterilized as it will discolor the aluminum cap.

In planning this container I have tried to make it as simple as possible, and I hope it may be of as much service to others as it has been to me.

121 St. James Place.

Immediate Closure of the Wound After Antrotomy in Acute Mastoiditis. E. J. MOURE. *Rev. hebd. de Laryngol.*, May 2, 1914.

In the majority of cases of acute mastoiditis we may, after having thoroughly cleansed the diseased area and opened the antrum, simply insert a drain into the antrum and completely suture the retro-mastoidean fold. This method has the great advantage of hastening the cicatrization and avoiding deformity after operation.

SCHEPPEGRELL.

SOCIETY PROCEEDINGS.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY,

EASTERN SECTION.

Meeting of January 17, 1914.

DR. LEWIS A. COFFIN, CHAIRMAN.

ADDRESS OF CHAIRMAN.

Dr. Lewis A. Coffin: I wish to thank the members of the Society for the honor that was done me in my election as Chairman of the Eastern Section of this Society and I wish in the name of the New York members to extend to our visiting members a most hearty welcome. About a month ago was held in this room a meeting of the Section of Laryngology of the New York Academy of Medicine commemorating the founding of the New York Laryngological Society forty years ago. This was the first Laryngological Society and the Laryngological Section of this Academy is its successor. At the meeting referred to, Dr. Delavan delivered an address in which he spoke of Dr. Horace Green as not only one of the founders of the Laryngological Society but as a pioneer in laryngological work in this country. There have lately come into my hands two letters written from the home of Dr. Green by Miss Julia Robertson, a patient, who was staying at Dr. Green's house for treatment. Miss Robertson afterwards married Gov. Pierpont, War-Governor of Virginia. I have thought that the following extracts might be of interest. They were written sixty-three years ago and are as follows:

12 Clinton Place, N. Y., October, 24, 1850.

Dr. Green has been the most successful physician in the United States in curing throat diseases, has gained a great reputation and has made a great fortune. I had felt a kind of desire to be under his care for several years, but said little about it because I thought it "out of the question." But here I am and Dr. Green has promised to do everything in his power to cure me. The house is very large and furnished elegantly—costly paintings and statuary are scattered all over the building. It is lighted by gas and the croton water, hot and cold, is carried all over it. There are speaking trumpets in the walls, in fact everything elegance or comfort could suggest. The Doctor is about 40, young looking, handsome, polite, but sometimes absent-minded, has traveled in Europe and likes style, but not dashing. The New York Medical College is at last done, and Dr. Green is one of the Professors. Last, but not least, I will tell you about my throat. Dr. Green sent for me to the office a few days after I came and looked at my throat. "Bad enough!" was his exclamation, "there is a deep ulceration out of sight, your physicians have not discovered it." said he. "What would you say, Miss R., if I should be obliged to cut away some of that bad flesh that is in your way there?" I replied, "Whatever you think best to do I will endeavor to submit to patiently." "Well then, the sooner it is over the better, do you not say so?" I answered, "Yes, by all means"—I seated myself and while he prepared his instruments, he said it would soon be over and spoke low and sweetly to assure me, but he was mistaken in his lady, I needed no coaxing and had determined beforehand to make no fuss, if it killed me—so I smiled and said nothing. Dr. Jenkins (Dr. Green's junior partner) came behind, I afterwards learned to hold my head, but that was unnecessary and he did not touch it. I sat perfectly still, and the Doctor cut off my left tonsil. The blood streamed from my mouth for about half an hour, and I then sat down and had the right one cut off, which started the other, and I bled until I could hardly hold up my head. After it stopped a little, a sponge application of nitrate of silver was applied and almost strangled me. The bleeding began again and continued until about two o'clock—for a few days I suffered a great deal of pain, but I had kind nursing and "French fixin's" to get well on. Yesterday what was my horror to learn that my palate must come off,

down I sat and off it came. I have hardly spoken a word since. The pain at times is intense. I am dreadfully hungry. They send up nice soft things to tempt me to eat, but it is a difficult matter to swallow. Except my throat, I am well, perfectly so, feel a great deal better than I did before I came, and look healthier, have a better complexion and no headaches. Hope is everything in this world, and I hope now to be cured.

12 Clinton Place, December 27, 1850.

You ask if I will ever talk again? Yes! and better and faster than ever, my throat improves daily. In fact I have entirely recovered and have begun to practice my singing lessons again. I wish that you could have been here on Christmas. It was truly a merry Christmas to us all. Any one that produces a laugh on Christmas or contributes to the atmostphere of fun and good feeling is considered a benefactor. I did my best at a burlesque of Dr. Green, and it took admirably. The Doctor has written two books—one on "Bronchitis" and another on "Croup." I got a very large box, carpeted it and furnished it with the children's furniture, selecting such as represented the office furniture, then I bought two ridiculous india-rubber heads and fastened them to jointed bodies, dressed them, one like a patient and the other like Dr. Green. I placed the old woman in the chair with her mouth wide open and her eyes rolled back, one arm up entreatingly and the other on his arm, while he stood stooping over with a stick and a swab on the end of it ready to sponge her throat. I had placed a little spittoon at her side, and on the table a bottle of nitrate of silver and a bunch of different sized representations of the probang. The probang is the name of the instrument he uses to make sponge applications with. On the center table I put miniature representations of bills, receipts, prescriptions, pamphlets, a tiny box of wafers, pencil, etc.—Oh! how they laughed! It was a pretty good take off, for Dr. Green stands in that position half of every day with his probang in hand treating first one then another. The doctor says he shall keep it for a sign, and every one who comes in is taken up to see "Green on Bronchitis and Croup." Oh, I put a baby in a cradle, that squeals horribly, for the croup.

Some Gateways of Cryptogenic Infection.

(a) The Alveolar Procceses: Dr. Wm. H. Haskin, New York.

Published in full in the March, 1914, issue of The Laryngoscope, *p. 169.*

(b) The Tonsil. Dr. George B. Wood, Philadelphia.

DISCUSSION.

Dr. M. L. Rhein: Discussing the oral infection part of this subject, I would say that the popular idea of dental infections is generally embraced by the idea of pyorrhea alveolaris. Dental organs, embracing the alveolus, teeth, pericementum and gums are not like the tonsils which have just been discussed, but are end-organs. When there is faulty nutrition, when the resistance to infection is lowered, it is much more liable to manifest itself by some abnormality in an end-organ than in any other place; this will always account more or less for the different phases of pyorrhea alveolaris. It is frequently an important diagnostic factor in some of the constitutional diseases where malnutrition plays an important role, but it is not the prominent etiological factor which in the last few years has been so commonly ascribed to it. The main reason for this is because the pus which comes from the gums and the alveolar structures in this stage is to a large extent eliminated. It undoubtedly has a great toxic effect, but it is by no means so powerful as the toxemias which result from other phases of dental infection.

The most serious type of dental infection is the alveolar abscess. Then we have another type, the pericemental abscess; that is a form of infection which exists between the lining membrane of the roots of the teeth and the periosteum of the jaw itself. Very little as been written about this form of abscess. In these cases the pulps of the teeth remain vital and the most acceptable theory of the etiological conditions of these abscesses is that this structure is the degenerate remains of the substance

from which the enamel of the teeth is formed, and on this account any micro-organism that may be in the circulation finds here a material which is more or less prone to infection, especially when the resistance of the body as a whole is more or less lowered. The diagnosis of these infections is very difficult and very rarely is made.

Now the alveolar abscesses result from infection of dead pulp tissue arising from the ordinary pyogenic flora such as are found in the mouth, more or less actively virulent. Where the inflammation becomes sufficiently powerful the purulent matters break through the alveolar plate and the abscess is easily recognized. Since we have had the aid of radiography, we have learned that we have a form of abscess that has a similar etiological factor with the conditions found in the crypts of the tonsils, which have formed such a prominent etiological factor in various forms of endocarditis. We have found what is known as a blind abscess or granuloma, where imperfect dental work has been done on the pulps of the teeth, or where the pulp has died without being taken care of and where its absence gave absolutely no discomfort and was not recognized by the slightest form of irritation. They also occur as the result of some trauma,—breaking down of the pulp connection as it enters the teeth. The reason these abscesses cause so little inflammation is because the infection appears invariably to be due to the streptococcus viridens. In the many cases in which cultures have been made the streptococcus has always been found. The virulence of this form of streptococcus is very slight; so its inflammatory action is not very high. We have here imprisoned in the spongy cryptoform cells of the alveolus a small abscess sac which sends forth continually a small amount of toxic matter through the circulatory media of the lymph channels, and we know from the nature of the specific character of this toxin that its attack is directed against the heart itself. The toxemia is the same as that caused by the cryptoform infections of the tonsils infected by the streptococcus viridens.

Your attention is especially directed to two practical points. These numerous infections are most often caused by imperfect dental work. There are, however, simple scientific methods of pulp technic which if properly followed out will leave the ends of the roots in such a condition that infection of these parts cannot take place.

DR. T. S. SOUTHWORTH: Your President has asked me to say a few words on this subject from a pediatric standpoint. In studying the cryptogenic infections as exemplified in children, we have to consider the deplorable conditions which exist in the teeth of so many of them. It is true that simple caries does not come directly under this head, but as Collyer says: "The amount of oral sepsis arising directly from carious teeth is small compared with the sepsis from conditions started by their presence."

Unquestionably, bad oral conditions affect the health of the child, and the poor nutrition and anemias which they cause render them more susceptible to the constant septic inoculation from carious cavities or diseased gums. Such effects are more commonly seen in infant asylums where in badly nourished infants and children gingivitis extends to the roots

of the teeth, causing necrosis of the jaw or even noma, resulting in deformity and often in death.

The public is only partly awakened to the importance of the care of the teeth in children. I agree heartily with a recent statement that no public foundation could be better employed for the benefit of the race than one which would deal with this problem.

Turning now to the tonsil: Two matters have been almost generally accepted by all thoughtful pediatricians; these are, first, the necessity for complete enucleation of the tonsils, and especially of buried tonsils, in all young persons subject to attacks of acute rheumatism; and second, the complete removal of the tonsils where there is definite or suspected tubercular enlargement of the cervical glands. Further, this is a good practice where there is recurrent enlargement of the cervical glands.

In this connection, it should be remembered that many of us believe that there is frequent enlargement of these glands from infections harbored in the crypt of the naso-pharyngeal tonsil calling for its removal. The presence of tonsillar plugs which may be extruded and swallowed, implants at intervals noxious bacteria among the flora of the intestinal tract. While this is doubtless rarer in youth than in adult life, it undoubtedly occurs, for we have all seen considerable masses of cheesy material in the buried tonsils of rather young children,—three to four years of age. That such implantations should be in part responsible for the disturbed nutrition and anemia of these children, is not unreasonable. Even styes, furunculosis, and acne have been ascribed to this source, and Elliott raises the interesting question whether chorea may not at times have this starting point.

Childhood is a good time to forestall and prevent these infections, and there is no knowing how much of the morbidity of later life may be prevented by proper attention to the teeth, and tonsils at an early age.

DR. EGBERT LEFEVRE: I have been very much interested in this question of oral sepsis and in the papers that have been read to-day. The subject has engaged my attention for some time, and I have been more and more impressed with the question of the infection of children from this source as compared with later years when the teeth show more of the effects of dental processes. There are several clinical features which are important. We have noticed a peculiar form of thrombosis occurring in certain portions of the body and subsiding, only to re-occur either on the same vessels or elsewhere. At one time, the intestinal tract was thought to be the source of the infection but later investigations have shown that a large percentage of cases are caused by the absorption of septic material from the mouth. Very often this is only controlled by a thorough cure of the mouth conditions.

We also have a type of anemia which, while it is in the early stage a form of secondary anemia, can become so progressive that in the later stages it shows the clinical picture of pernicious anemia. What micro-organism causes this particular anemia we do not know, but it is frequently associated with oral sepsis; it is not a general infection of the blood stream by the micro-organism, as blood culture shows no growth.

Dr. Rhein spoke of the streptococcus viridens, and its relation to malignant endocarditis. That is the most destructive of all the organisms we have in the mouth, and when it gains entrance to the blood stream can cause primary malignant endo-carditis. It may, however, find lodgment elsewhere in the circulatory system and produce a fatal sepsis. Cardiac valvular disease can be caused by the streptococcus viridens without the organism finding lodgment in the heart. The toxins, absorbed from any focus, can cause inflammatory changes in the endo-cardium and later chronic valvular deformity. In all cases of recurring endo-carditis of obscure etiology, careful examination of the mouth for foci of infection should be made. Too often, we are satisfied with a cursory examination. The examination should be a thorough one. As has been pointed out, frequently the condition can only be detected by the aid of the x-ray.

Time does not allow discussion of the relation of oral sepsis to the so-called "rheumatic" pains and arthritis conditions.

An unfortunate phase of the propaganda for the care of children's teeth is that where patients are sent to the dentists to have the teeth corrected it often happens that on account of faulty treatment a worse conditions is introduced, new avenues of infection opened up, and the condition made worse. The dental societies and all those connected with them should insist that more careful treatment be given to these cases, and those who are supposed to take care of the teeth should have a better knowledge of bacteriology and oral hygiene.

Dr. Southworth spoke of the infection through the tonsil by tubercle bacilli. This avenue is most important, especially from the pediatric standpoint. While there is care of the mouths of children after the dentition is begun, very little attention is given to the mouths of children before. I have noticed large numbers of cases in which tuberculosis has come from the retention in the mouth of food, milk, etc., which has evidently been infected by the turbercle bacilli.

The Diagnosis and Treatment of Brain Abscess DR. WILLIAM W. SHARPE.
Published in full in THE LARYNGOSCOPE, *March, 1914, page 201.*

Barany's Theory of Cerebellar Localization: Practical Bearing on the Diagnosis of Cerebellar Abscess. DR. PHILIP D. KERRISON.
Published in full in THE LARYNGOSCOPE, *March, 1914, page 192.*

DISCUSSION.

DR. E. B. DENCH: I have been deeply interested in both of these papers, and especially in what Doctor Sharpe has said about the relative frequency of cerebral and cerebellar abscess.

According to my own experience, brain abscess occurs above the tentorium about twice as frequently as below the tentorium. Certain English statistics have been published in which the relation has been reversed. From a clinical point of view, however, I am certain that as far as otitic abscess is concerned, all observers will agree that they are found about twice as frequntly above the tentorium as below it.

Regarding cases in which the abscess has remained latent for a long time, I remember one case in which an abscess, situated in the region of

the Island of Reil and of the inferior frontal convolution, was found ten years after an acute otitis. Ten years after the primary attack, the patient had a second involvement of the same ear, followed by a mastoid operation for the relief of this acute condition. Symptoms of brain abscess appeared, and the abscess was found in the region above mentioned. The thickness of the abscess wall made it extremely probable that this abscess had remained latent since the first attack of acute otitis, ten years before.

With reference to the value of nystagmus toward the affected side, as a diagnostic sign in cases of cerebellar abscess, I would cite an interesting case which came under my observation at the New York Eye and Ear Infirmary. This patient came to the hospital with symptoms of dizziness and a nystagmus toward the healthy side. The ordinary radical operation was done, but the patient's vertigo continued, and the nystagmus then became reversed and was toward the diseased side. At a second operation, one of my assistants removed a large sequestrum from the petrous pyramid. The internal auditory meatus was easily demonstrated upon this sequestrum. After the second operation all of the patient's symptoms disappeared. In this case, there was evidently a localized meningitis about the trunk of the auditory nerve.

I was very glad to hear Doctor Sharpe advocate so unreservedly the value of a decomposition operation in brain abscess, especially where the abscess cannot be exactly localized, and also to learn that he advocated the performance of the operation for draining the abscess in two stages,—first, doing a decompression operation, walling of the suspected area, and later opening the brain substance.

My impression is that I was the first to put this suggestion in print. (Transactions of the American Otological Society, 1906, Vol. X, Part 2, page 266.) I am also equally certain that this observation was not entirely original upon my part but was the result of a conversation with Mr. Ballance, of London, in which he suggested the possible advisability of this measure. As far as I knew, however, the article above referred to is the mention of this matter in literature. I believe this plan is eminently advisable in all cases of brain abscess in which the abscess cannot be opened along the avenue of infection. As the result of the decompression operation and packing of the subdural space with iodoform gauze, a line of adhesion is formed completely obliterating the subdural space. These adhesions form very rapidly and should be fairly firm at the end of twenty-four or forty-eight hours. The subsequent exploration of the brain substance can then be carried out, and if the abscess is opened, a purulent meningitis is not likely to result from infection of the cerebral membranes from the pus from the abscess, as the arachnoid space is completely walled off. Moreover, as a result of the decompression operation, the pus in the brain substance will naturally tend to travel along the line of least resistance, and will, consequently, point, as it were, toward the surface of the brain, The urgent symptoms due to brain abscess are usually pressure symptoms. The decompression operation relieves these pressure symptoms, and, at the same time, favors the pointing of the abscess, which can then be opened with comparative safetly through the exposed area, as the arachnoid space has been completely shut off as the result of the preceeding decompression operation. I believe Doctor

Sharpe is right in the statement that these decompression operations should be performed through a sterile field. In other words, if, on exploring carefully the tympano-antral roof, we find absolutely no evidence of any avenue of infection, I believe it would then be wiser to do a sub-temporal decompression through a sterile field and open the brain substance at a subsequent period, rather than to extend the previous operative field in doing the compression. I heartily agree in the advantages of the wide field of exposure for draining cerebellar abscesses. I believe here that a preceding decompression operation is a good procedure, unless some definite avenue of infection leading directly into the brain substance can be discovered.

Regarding the treatment of the case after the abscess has been opened, I am perfectly certain that in some of my earlier cases a fatal result could be attributed to too much exploration of the abscess cavity. We must remember that in these patients the abscess has existed for some time. Consequently, if we simply open the abscess, put in a drain, and allow the normal brain pressure to obliterate the abscess cavity, we are doing our best for these patients. The idea that we must investigate every nook and cranny of the abscess cavity and wipe out carefully every drop of pus in order to obtain a successful result, is, I think, a wrong idea. I do not believe in the use of the encephaloscope or any such instrument in the treatment of brain abscess. My own practice in recent years has been to simply separate the lips of the incision in the brain abscess by means of thin retractors, so as to allow the pus to escape freely. A cigarette drain, of proper size, has then been introduced into the abscess cavity and the dressings have been changed as infrequently as possible. At the end of a week or ten days a strip of folded rubber tissue has been substituted for the cigarette drain. This plan of treatment has given me better success than any other in my own cases. I have no experience in using the glass tubes, suggested by Doctor Sharpe, but I believe that they may be very valuable.

In closing, I wish to say that we are very much indebted to Doctor Kerrison for his exceedingly good presentation of Barany's recent work. All of us are at present investigating along the lines suggested in Barany's original article, which has been so admirably translated and explained by Doctor Kerrison.

Dr. Foster Kennedy: Two points have been made by Dr. Sharpe which seem to fit closely together,—first, the latency of a tempero-sphenoidal abscess; and, second, the successful outcome of operations on such. Owing to the first, the difficulty in localizing the lesion is very great, but just for that reason abscesses, in the right temporal lobe at any rate, can be dealt with more radically and more successfully than can lesions in other brain areas. Stress should be laid on the peculiar physical phenomena engendered in these conditions. These were called by Hughlings Jackson, "Voluminous mental states." In these, there is no loss of consciousness, but rather a curious change of consciousness which seems to be in some way enlarged, with a curious feeling of reminiscence,—the so-called dreamy or reminiscent state. Some of these sensory resuscitations may be very complex and of such vividness as to amount to projections of the person's consciousness so that they dream dreams and see visions. Associated with these are manifestations of uncinate irritations,—as,

for instance, in the case of one of my patients who was haunted by an old woman in vile-smelling rags, whom four or five times a day she saw at the foot of her bed. This apparition,—of the unreality of which she was quite aware,—constituted her major seizure. The minor attacks were a changed consciousness, "a peculiar, unearthly feeling." She had the usual signs of intra-cranial pressure: headaches, vomiting, and choked discs. There was also a gradual weakening of the face, arm and leg on the left side, the parts being named in the order of the severity of their affection. The facial paresis was more marked on emotional expression; if one thalmus be pressed upon, the opposite side of the face will be unable properly to express emotion. Further, from the positions of the motor center, pressure directly upward from the temporal lobes will damage first the facial, then the brachial, and last and least, the leg center. Hence, the hemiplegia induced by tempero-sphenoidal expanding lesions is of the type described as being present in Dr. Sharpe's' patient,—most marked in the face, less in the arm, and least in the leg. So much for the paralyses.

As regards the reflexes, it might be well to remember that a unilaterally depressed abdominal reflex is the most delicate sign of ingravescent pyramidal pressure. The text-books tell us that word deafness is the result of left-sided temporal abscess. This is not so. Abscesses grow slowly and cause not a destruction but a deterioration of word centers, so that the word memories become elusive, especially those of names which have much fewer associations in the brain than do verbs, adjectives, and prepositions.

As regards operative procedure, it would appear wise in right-sided cases to attempt to enucleate the lesion and in the case of abscess on the left side to drain and create as little disturbance as possible to cerebral tissue lest destruction of the transverse gyri of Heschel result in a disastrous sensory aphasia.

DR. S. MACCUEN SMITH: The subject has been freely discussed and the time is short; so I will speak briefly. Notwithstanding the advance in the past two years in the diagnosis of intra-cranial lesions, we are still very much in the dark, especially as to the localization of the average case of brain abscess. In my opinion, it is the most difficult task that we, as well as neurologists, have to accomplish.

Pain is of great importance. In the cases that I have seen, it has been a very constant sign, and in those cases of temporo-sphenoidal abscess formation it has been more especially marked over the frontal region of the affected side.

As to localization: I think we probably have to guess at it in a good many instances. In some of my most striking cases it has been almost purely a guess, notwithstanding that I have had the aid and support of eminent neurologists. The majority of brain abscesses are located in the temporo-sphenoidal region, and given this fact, and then the signs of pressure, I believe that, notwithstanding the fact that we know we have an abscess formation of the brain but cannot definitely locate it, we are justified in operating on the temporo-sphenoidal lobe.

In spite of the fact that Dr. Sharpe does not believe in draining through the avenue of infection, most of my cases have been drained through that avenue. In these cases there was some evidence of carious erosion

involving the tegmen antri or tegmen tympani, or else the osseous structure was entirely eroded, exposing an inflamed dura. In the few cases in which we were able to get an autopsy, it would seem that the patients died as a result of satellite abscess formations which were separated from the parent abscess by a layer of healthy brain tissue. In other words, the abscesses did not communicate one with another, as has been found by Neumann and others in their cases.

DR. MCKERNON: I did not come in until Dr. Sharpe was well advanced in the reading of his paper and I should like to ask one or two questions. First, I should like to know how large a needle Dr. Sharpe uses; second, he speaks of almost always finding absence of the stalk. That coincides with my own experience. I have seen this in only two cases which led to the abscess cavity. This is contrary to many text-books, which tell us to look out for and follow the stalk, and the infection will be found.

I am glad to hear Dr. Sharpe speak of his experience as coinciding with that of others. I should also like to know if he does a simple decompression prior to his inspection of the brain cavity, as was suggested by Dr. Day several years ago. I have operated on two cases in the past year by this method. One case developed cerebral edema, but the patient recovered and I believe that the absence of the meningitis was largely due to the fact that I did the decompression on one day and the exploration twenty-four hours later.

He also spoke of glass tubes, and I understood him to say that one was inside of the other. I have not used glass tubes, but I have employed the ordinary drainage tube and cigarette drain, and lately I have used rubber tissue, rolled tightly together.

A word in regard to the trauma that we have been in the habit of inflicting in these cases. If a brain abscess is opened, drained, and let alone, you conserve the best interests of the patient. If you put in your finger and cause a lot of trauma, you increase the danger to the patient and cause conditions that will result disastrously. Open the abscess, insert a drain, and let it alone.

Dr. Dench spoke of metastatic abscesses. I have seen only one metastatic abscess; that was six weeks from the time of operation where the metastatic deposit was close to the Island of Reil. I am very glad to have had the opportunity of hearing Dr. Sharpe's paper.

I was also interested in Dr. Kerrison's paper and think that the points he brought out are very valuable and should be taken up by all.

DR. SHARPE, closing the discussion, said: As the majority of operations for brain abscesses are exploratory, it is naturally a very dangerous procedure to open the dura or to puncture it blindly through an infected area like the mastoid; if no abscess is found, then the danger of a meningitis is very great; besides, if only a small opening is made, the danger of a meningitis and also of a medullary abscess are to be feared the more. The decompression opening should always be a large subtemporal one; through this opening, all parts of the temporo-sphenoidal lobe may be carefully explored, as in the case described. The ventricle puncture needle has a lumen of one-eighth of an inch; its point is blunt, so that it will push vessels to one side and not puncture them; there is very little danger in using such a needle. A decompression is in no sense a decompression *unless the dura is opened.* The dura in adults is

inelastic, so that the mere removal of bone does not relieve intra-cranial pressure to any beneficial degree. Drains of rubber tissue, cigarette drains, and even rubber tubings are very unsatisfactory, as they become blocked very easily. The double glass tubes have been most helpful.

Syphilitic Affections of the Eighth Nerve. DR. ARTHUR W. M. ELLIS.

Dr. Ellis pointed out the frequency of involvement of this nerve early in the course of the disease, and reviewed the literature on the subject.

He reported seven cases which he had had under his own observation, five of which had occurred within the first year of the disease, and laid special emphasis on the findings in the spinal fluid of these cases, all of these patients showing in their spinal fluid positive evidence of a syphilitic meningitis, i. e., increased cells, a positive globulin reaction, and in five of the seven cases a positive Wassermann reaction in the spinal fluid. He called attention to the fact that these patients showing involvement of the eighth nerve were cases of a wide-spread and serious infection, i. e., syphilis of the central nervous system. The results of treatment in these cases had been very favorable.

The hearing in the five cases which occurred early in the disease and in which treatment had been instituted shortly after the onset of the disturbance of hearing had in all markedly improved, all five of these cases having now normal hearing for watch tick and whispered voice. The spinal fluid had been reduced to normal in all but one case still under treatment.

He emphasized the necessity of treating these patients until the spinal fluid returned to normal, i. e., they must be treated as cases of syphilis of the central nervous system and not as cases of isolated ear disease. To accomplish such results, a large amount of treatment is necessary in many of the cases. In one patient a normal spinal fluid was not obtained until the patient had received 14.5 gm. of salvarsan, 9.35 gm. of neosalvarsan and 35 intra-muscular injections of mercury.

In conclusion he urged the examination of the spinal fluid in every case of disturbed hearing occurring in a patient infected with syphilis, and absolutely insisted on repeated examinations of the fluid for the intelligent treatment and subsequent observation of all patients suffering with syphilis of the central nervous system.

DISCUSSION.

DR. F. L. JACK: We are very much indebted to Dr. Ellis for his interesting presentation of this subject. The question of syphilis of the eighth nerve opens up a number of points for discussion, but I shall confine my remarks to the use of salvarsan.

I understood Dr. Ellis to say that there has been an increased number of cases of affection of the cranial nerves since the use of salvarsan as compared with the number before its use. This statement agrees with that of Alexander but is hardly borne out in literature. The important fact for us to decide is whether the use of arseno-benzol is followed more frequently by affections of the eighth nerve than is that of mercury. It seems to me that the opinion of the syphilologists in this connection would be important. The view of most of those whom I consulted was that an affection of the eighth nerve due to salvarsan would be a wonderfully rare accident, and hundreds of cases were cited which had no untoward symptoms. The only case of cranial nerve affection spoken of was

one of the optic nerve which followed a dose of 0.6 g. of salvarsan, and was the only one in 2,000 injections of "606." The case was seen by my brother for an optic neuritis, later developing iritis. The patient subsequently had four or five injections of salvarsan, but the disease continued and ultimately the eye was lost.

Dr. Ehrlich is of the opinion that when these lesions occur the amount of salvarsan has been too small, the doses failing to devitalize certain groups of spirochetae lodged in the nerve sheaths.

Dr. Duel and Dr. Fordyce have done much to put this question on a practical basis. Dr. Duel has reported many cases from literature and he is of the opinion that the affections of the eighth nerve were due to the syphilitic virus rather than to the salvarsan. Dr. Fordyce has reported several hundred cases in which salvarsan was given and not one case of auditory nerve disturbance.

Dr. Abner Post, of Boston, in a recent paper on the use of salvarsan states that "Were the worst allegations realized, they would be less dreaded than the fatal effects of tabes and general paresis, which we hope to forestall. The accidents are wonderfully few. We may, perhaps, regard the use of this new drug as surgeons have regarded various serious operations—dangerous at first, their danger has been gradually diminished almost to the point of extinction by experience and improvement in technic."

DR. DUEL: I fear that Dr. Jack has over-estimated the value of my contribution to this subject. It so happened that two years ago four cases came under my observation within a short period of time, all of which had been treated for about two months previously by salvarsan; so I looked up the subject and reported the cases.

Dr. Ellis' paper is eminently practical and valuable, especially from the standpoint of how we are to attack this condition. All the men who have made investigation of a large number of cases (with the exception of Alexander, of Vienna) have concluded that the lesion in the eighth nerve is due to the syphilitic spirocheta and not to the toxic effect of the drug. That is a highly important point but it will not do to stop there.

A very important point which Dr. Ellis has brought out is that none of us have been treating our cases with sufficient care or with sufficient dosage of salvarsan. The results which he has recorded in his paper are evidence to me that many cases which I see and which are turned over to the syphilologists to treat have not been handled properly. They should have had larger doses and more careful observation. They should have been examined to see if further doses were necessary. Unfortunately it is difficult to follow up these clinical cases, but of those that I have been able to keep under observation none have shown any marked improvement.

This paper has been of great value to me inasmuch as it has shown that better results may be expected when treatment is pursued with sufficient vigor under careful investigation.

DR. JOHN D. RICHARDS said that he could add but little of definite value to what had already been presented. The exact nature of the ear lesion which follows the administration of salvarsan has had some light thrown upon it by the opthalmoscopic examination of those eyes which

occasionally become suddenly blinded following the administration of the same remedy. In some of these cases there has been revealed upon examination a thrombosis of the central retinal vein, with accompanying hemorrhages in the retina, and there follows subsequently an atrophy of the optic nerve. The blindness and the atrophy of the optic nerve, however, are the end-results and do not represent the original lesion which is a vascular. Similarly in the ear, the deafness and the subsequent atrophy of the nerve are often the end-results, the original lesion being, as in the eye, a vascular lesion. If we translate the ophthalmoscopic picture to the labyrinth we shall, no doubt, get an accurate idea of what occurs in some of the cases where deafness suddenly follows upon the administration of salvarsan.

DR. BLACKWELL asked Dr. Ellis how much hearing the patients had prior to the treatment.

DR. ELLIS: I think that Dr. Jack misunderstood me as to the frequency of these lesions of the eighth nerve occurring after the administration of salvarsan. I do not feel that there is any definite evidence that these lesions are more frequent since the use of salvarsan than before, but it does appear certain that in patients inefficiently treated with salvarsan these lesions, when they do occur, are more severe. It is this increased severity which has probably called attention to their frequent occurrence. The milder lesions, occurring in patients untreated with salvarsan, have escaped the attention of all but a few who, being especially interested in them, carefully examined all cases from this point of view. We are all familiar with the frequency of dizziness in the secondary stage of syphilis. The experience of those who have carefully investigated the hearing in these patients is that the dizziness is frequently associated with a definite disturbance of hearing and is due to a definite lesion of the eighth nerve.

Replying to the remarks of Dr. Richards: I do not think that the lesion which he has mentioned, a venous thrombosis, is the usual lesion in these patients although such cases probably do occur. We know that thrombosis of the veins in the course of syphilitic infections of the central nervous system does occur in the secondary period, but this is not the usual lesion, which is most characteristically a meningitis. I think the probability is that in these disturbances of the eighth nerve the lesion is one secondary to such inflammatory reactions in the meninges rather than thrombosis of the veins. Regarding the portion of the nerve which is involved in these cases, an analysis of 150 cases collected by Benario showed that about 50 per cent of the cases have both the vestibular and cochlear branches affected, while in the other 50 per cent the cochlear nerve alone is involved. Isolated lesions of the vestibular nerve have been reported but are extremely rare, there being only some five cases in the literature.

Replying to Dr. Day: Intraspinous injections of serum have not been used in the treatment of these cases.

Replying to Dr. Blackwell: The disturbances of equilibrium were subjective only in all but one patient. This patient had a marked spontaneous nystagmus, great dizziness, inability to stand, severe nausea and vomiting. Two of the seven cases showed spontaneous nystagmus.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, February 25, 1914.

J. HENRY GUENTZER, *Chairman.*

Carcinoma of the Larynx, Tracheotomy, Thyrotomy, Radium Treatment.

DR. HARMON SMITH.

J. P., aged 55, was admitted to Dr. Smith's clinic at the Manhattan Eye, Ear and Throat Hospital, October 4, 1913. He complained of hoarseness over a period of two years, intermittent at first but continuous for the last six months. The family history was negative. The specific history was also negative. For three months previous to admission to the hospital he had complained of discomfort in the larynx with slight pain in the left ear at irregular intervals. The examination revealed a small ulceration upon the left vocal cord, around which more or less papillomatous-looking projections had sprung up. The surrounding tissues were red and indurated and the picture resembled syphilis. On October 7 a Wassermann test was made which proved to be negative. On October 28 a small piece of the growth was removed for microscopical examination which was reported as papilloma. Following the removal of the first piece the tumor increased rapidly in size and extended to neighboring tissues, which led to the belief that the growth was malignant rather than benign as reported. A second piece was then removed, which the microscope proved to be cancer. The patient was then examined by the internist to determine if operative measures could be instituted with reasonable hope of success. This examination revealed chronic kidney and heart trouble with atheromatous arteries, and Dr. Smith was advised that general anesthesia or prolonged surgical shock would be fatal to the patient. He then considered the use of radium and consulted one of the leading surgeons possessing a tube of radium of high activity, to obtain if possible his aid in the matter. This surgeon advised a tracheotomy after which the radium could be left in place as long as was necessary without discomfort to the patient and without interference to respiration. Accordingly a tracheotomy was performed under local anesthesia on November 29, from which the patient recovered quickly. At the end of a week the surgeon was again consulted relative to employing the radium, at which time a history of the case was given more in detail, from which it was determined that the employment of radium would be unavailing. Under cocain anesthesia a thyrotomy was performed on December 2, and the left wing of the thyroid was found to be uninvolved, so that the muco-perichondrium could be stripped from within the cartilaginous box and the tumorous mass together with apparently sufficient healthy tissue removed to warrant the hope of non-recurrence. The patient was per-

mitted to swallow sterilized milk and water after forty-eight hours and during the course of his recovery lost but little in strength or weight.

About two weeks subsequent to the thyrotomy Dr. Fruedenthal was requested to apply his radium to the larynx, which was done, the tube being left in place twenty-four hours. Following this there was great induration of the tissue and the appearance of the larynx resembled a syphilitic condition. In January, Dr. Freudenthal made a second application, but at this time the tube was retained but a few hours; consequently there was no effect following it. Shortly after this it was noticed that the growth had extended posteriorly and had involved the opposite side. As a complete laryngectomy was out of the question and as radium had been of no avail there was nothing left either in treatment or surgery that justified any hope of benefit.

Dr. Smith said that he believed that an error in judgment had been committed in not making a diagnosis of carcinoma from the history and clinical conditions rather than having relied upon the negative report of the microscope and that if complete laryngectomy had been performed in the earlier stages, reasonable hope of recovery might have been entertainel, provided the shock of the operation upon the diseased heart, kidneys and circulation had not proved fatal.

Lympho-sarcoma of the Tonsil. DR. HARMON SMITH.

Dr. Smith said he presented this case and the foregoing case with a view to demonstrate two points. First, that where there is a reasonable expectation for recovery, disappointment often follows, and second, that in cases thought to be hopeless, good results are occasionally obtained.

The patient, D. R., 23 years of age, had been sent to Dr. Smith on January 11, 1913, from the General Memorial Hospital, to have removed if possible enough of the tumorous mass in his oro-pharynx to allow him to swallow and to alleviate his disturbed respiration. The tumor at that time was so large that it occluded about three-fourths of the oro-pharynx and not only hindered breathing to the extent that the patient sometimes became cyanotic, but made deglutition all but an impossibility. He had been treated with Coley's serum without any effect. The patient said he had fallen on his head when a child and after this he had had a number of epileptic fits. At one time during his stay in the hospital he had as many as twelve fits a day.

Dr. Smith did not give the patient or his family any hopes of his recovery and did not assure them that the operation would relieve the symptoms. Before operating a preliminary tracheotomy was performed, as he felt that there would be considerable hemorrhage. Operation was begun on the tumor by first inserting a row of sutures through the soft palate as close to the left tonsil and pharyngeal wall as the induration of the palate would permit. Dr. Smith said he controlled the greater part of the hemorrhage with these sutures as he went on with his incision. He then made a curvalinear resection with scissors, which was begun close to this row of sutures and then carried along the junction of the soft and hard palate over to the right tonsillar mass, and embodied in the part removed the uvula and three-fourths of the soft palate. Then

the base of the right tonsil was attacked by blunt dissection from below upwards, enucleating the tumor from what looked like a capsular formation. This was not difficult until the upper part of the tonsil and pharyngeal wall were reached, when it became necessary to cut away with scissors the part of the pharyngeal wall upon which the tumor had encroached, which extended up almost to the Eustachian prominence. Dr. Smith said he had expected severe hemorrhage, but after tying off a few bleeding vessels the oozing was easily controlled by hot boric acid applications. He cauterized some of the indurated soft palate with the Paquelin cautery, which successfully controlled the hemorrhage in that region. The tracheotomy tube was left in place for a few days as a recurrence of hemorrhage was feared. The patient made an uneventful recovery.

He was not again seen in the clinic until January 27, 1914, at which time he showed every evidence of increased constitutional vitality and was able to breathe and swallow without hindrance. The tumor did not recur and at its site could be seen a clean, white scar, but on the left side, running up behind the palate there was a bluish-red linear mass, which Dr. Smith believed to be a recurrence of the growth. After making two fulgurations to the lesion without any effect he removed, under cocain, as much of this growth, with the galvano-cautery knife, as could be removed without extensive procedure, and under the microscope the specimen proved to be lympho-sarcoma. The patient told Dr. Smith that he had had no more epileptic fits and was able to carry on his work.

After taking into due consideration the good effects following the first operation it seemed perfectly justifiable to Dr. Smith to make an attempt to radically remove the smaller growth of the opposite side.

DR. MYLES said that he did not really understand what the pathologists meant by polypoid degeneration. It is very common in these cases to see the so-called flat or semi-pendulous polypoid condition return to normal after the venous circulation is restored and the congestion and pressure are relieved. The pedunculated type creates a pathology of its own, and remains in that condition until removed by surgical procedure.

Case of Streptococcal Pan-sinusitis; Meningeal Irritation; Acute Multiple Arthritis. DR. J. H. ABRAHAM.

Miss M., age 35, trained nurse; patient reports no serious illness whatever previous to November 24, 1894, when she was operated on for removal of her right kidney on account of abscess. Left hospital on December 31, 1894, in good condition.

Present history: Patient was taken ill December 1, 1913, with a severe cold in the head, followed by sharp, darting pains over the eye and frontal region on right side, with a high temperature and pulse. A profuse purulent, yellowish, thick discharge on right side of her nose, with a distinct disagreeable odor lasting from four to five days. During this time she was under the care of her family physician who requested that he be allowed to call a specialist in consultation. On December 6, owing to her condition not improving, she consented, and I was called in consultation.

On examining the patient I found the right nasal cavity filled with a thick, yellowish, purulent discharge, and on examining the post-nasal

space, no pus could be detected flowing from the sphenoidal cavity. Pain over the right supra-orbital and frontal region on pressure. Temperature 103°, pulse 120. Diagnosis of right frontal, ethmoid and antrum empyema was made. After a thorough cleansing of the nasal cavities a free discharge from the frontal, ethmoid and maxillary sinuses was found; so I ordered local applications of adrenalin, steaming of the head every three hours and internal medications; this was followed by a slight improvement as to character and amount of discharge. I examined her again on December 14 and found symptoms of meningeal irritation were present as follows: There was slight photophobia twitching of the muscles of the neck, disturbed sleep; patient moaning and very restless, with slight twitching of the muscles of the body and excruciating pains in the back of the head. On December 15, patient was ordered to the Polyclinic Hospital for operation. Owing to the fact that a unilateral nephrectomy had been performed and the remaining kidney was in a cystic condition, a general anesthesia was out of the question. Pus examination from the nose proved the presence of practically pure streptococcic growth from which an autogenous vaccine was made. Owing to the poor physical condition of the patient a general anesthesia was contra-indicated. Therefore, one hour before operating, the patient was given hyperdermically ¼ morphin and 1-150 of hyoscin. Local anesthesia, adrenalin and cocain. I was positive from the above symptoms that the patient's most serious involvement was of sphenoidal origin. Even without the presence of any pus in the post-nasal space, I decided to enter the sphenoidal cavity; so after removing the middle turbinate I found the anterior wall of the sphenoidal sinus very red, excruciatingly tender, and markedly bulging without any free flowing of pus. The sinus was opened, and pus was discharged under great pressure and quantity. The ethmoids were next attacked and owing to the marked involvement the septa between the various cells were broken down, converting the cells into one large sinus, which was opened. The pus flowed freely, but under no pressure. The cells were removed as far back as the sphenoid. The naso-frontal duct was enlarged and pus flowed freely from the frontal sinus. Owing to the weakened condition of the patient, it was necessary to open the antrum very hurriedly, which accounts for the removal of a greater portion of the anterior end of the inferior turbinate than I usually find necessary. The antrum was opened through the inferior meatus and pus flowed very freely. In all, at a rough guess, I should say there was removed from the various sinuses at least one-half tumbler full of pus. I must admit that the operation was a little more painful than ordinary, which I can account for by the great involvement of the various sinuses and by the fact that the pus was under such great tension, which undoubtedly prevented the absorption of the local anesthesia. The cavities were syringed, no packing employed, patient returned to bed. On the evening of the same day, the patient complained of severe pains under the ball of the right foot, and on the following day both feet and right knee were very much swollen, and on the day following she complained of pain in the elbow and wrist. Local applications of oil of wintergreen were applied with cotton dressings and intra-venous pyramidon, salicylate of soda and strychnin were administered. On December 18, patient received the first vaccine, which was followed by the usual reaction. After intra-nasal syringing

of the various sinuses, the discharges from the nose were very markedly decreased, also all pains in the head and neck. Patient continued to improve and left the hospital in ten days, and resumed her vocation January 22. At present, patient is free from all nasal discharge and arthritic symptoms and seems to be enjoying very good health. The case to me is an extremely instructive one, owing to the meningeal symptoms plus arthritic involvement, possibly streptococcal, the latter infection no doubt was secondary to the intra-nasal lesion.

Intra-venous Injections of Colloidal Copper and Mercury in the Treatment of Two Inoperable Cases of Carcinoma of the Larynx and Tongue. DRS. C. JOHNSTONE IMPERATORI and HARMON SMITH.

When patients present themselves with carcinoma of the upper respiratory tract, recognized to be beyond surgical relief and therefore unquestionably beyond the reach of radium, x-ray and other therapeutic measures, the physician is frequently willing to adopt any procedure that may possibly offer either relief to the sufferings of the patient or delay the advance of the disease. Having noted the report of Loeb* and his associates concerning the treatment of cancer by the intra-venous injection of colloidal copper, it appeared that a decided advance had been made in the therapy of cancer and warranted experimental use of the same in this class of cases. We are indebted to the direction and services of Dr. Silas P. Beebe, of the Loomis Laboratory of Cornell University, for the preparation and direction in the administration of collodial copper and mercury in the two cases whose histories follow.

A brief resume of the method of preparation of the colloidal copper is as follows: An electrical current of 110 volts, 5 amperes, is passed between pure copper electrodes, which are immersed in pure distilled water, which has recently been boiled to drive off all the gases and air contained therein. The current between the electrodes must produce an arc, but not touch each other. After passing the current through the water for a short time, it assumes a milky appearance. To standardize the solution, determine the amount of copper by evaporating 25 ccm. of the solution nearly to dryness and add a drop of dilute sulphuric acid to this residue; the blue color resulting is compared with the standard Fehling solution. The solutions used contained approximately 3 milligrams of copper per 100 ccm. The colloidal mercury solutions are prepared in the same way, except that one electrode is of pure mercury and the other of platinum, the latter representing the positive pole. The strength of the mercury solution is 18 milligrams of mercury per 100 ccm. of solution. The metals are in such a finely divided state that they remain in solution for some time, but there is an element of doubt as to whether this method produces a satisfactory colloid, although it is the procedure pursued by the originator.

Fresh solutions of the colloidal copper were supplied each day. The mercury solution, which keeps better, was supplied every other day. Before injecting either of the solutions they were warmed to the body temperature. The first injections were made into the dorsal vein of the

*Loeb, McClury and Sweek. "Treatment of human cancer with intravenous injections of colloidal copper." Interstate Med. Journal, Vol. 29, 1912, p. 1015.

hand and each vein of the arm was employed, proceeding from below upwards, the injection being made in each instance just in advance of the former. Usually a local endo- or peri-phlebitis took place at the site of the injection. An attempt to inject below the site of the former injection invariably resulted in failure even though the veins appeared to be fairly well filled with blood and the flow through the inserted needle demonstrated the presence of blood in the vein. In a few instances the tip of the needle penetrated the venous wall and the solution was injected into the surrounding tissue, which caused a circumscribed area of edema, followed by induration, that lasted for some time. On three occasions the surface veins which had been previously injected were exposed, and the needle inserted within the lumen of the vein, but it appeared to be entirely obliterated. Following the injection of either copper or mercury solutions, the patient frequently became restless for a period of one to two hours. In all injections of over 250 ccm., the kidneys seemed to be actively affected, so that free urination resulted. The blood pressure was increased by the injection, from 10 to 30 milligrams of mercury, when the larger amounts of fluid were injected. The average length of time employed for an injection was about twenty minutes, when using 500 ccm. of the solution, but towards the end of the period when injections were made, the time was often extended to one hour, owing to the difficulty in reaching the surface veins.

Case 1: P. C., male, aged 45 years, iron worker, was admitted to our clinic at the Manhattan Eye, Ear and Throat Hospital, December 31, 1912. His family history was negative as regards cancer. The past history revealed a history of syphilis twenty-nine years previously for which he had been treated only a short time. He had been married for a number of years to a healthy woman, who had, however, never become pregnant. He had been an inveterate pipe-smoker and a heavy drinker. About two years before coming to the hospital he had noticed a thickening on the right margin of the tongue which has gradually extended, involving the entire tongue. Eight months previously he had begun to lose weight and during this period has lost over thirty-four pounds.

Physical Examination. General. The patient was a small, emaciated man, appearing to be about 60 years of age. His pulse was 88, temperature 99°, respiration 20, blood-pressure 160, with a moderate arteriosclerosis. Urine showed a faint trace of albumen with a few granular casts.

Special Examination. The tongue protruded slightly from the mouth and was fixed. Situated on the floor of the mouth, mainly on the right side and extending down to the region of the hyoid bone was a large mass of stony hardness. There was a superficial ulceration of the skin just above the hyoid bone. The epiglottis was infiltrated and edematous. The vocal cords revealed no apparent involvement. The superficial and deep cervical lymph nodes and all the glands of this region were enlarged on both sides of the neck. The diagnosis of epithelioma was made both from the history and general appearance and confirmed later by microscopical examination of a piece of the tissue.

Treatment: The first intravenous injection was made on February 4, at which time 15 ccm. of colloidal copper was injected. Daily injections were then made in increasing doses, until on March 13, 500 ccm. was

given. Twenty-five injections of the colloidal copper were made in all. On April 6, not having given any colloidal copper for over three weeks, it was determined to try colloidal mercury, 5 ccm. of which was injected directly into the tumor. After two days this procedure was repeated. No apparent benefit resulted. The Wassermann and Noguchi reactions remained positive throughout the time the patient was under consideration; also the blood-count remained fairly constant, the average red cell blood-count being 4,000,000 per cm., and the hemoglobin about 50 per cent. The average temperature was about 100°, with an occasional elevation of from one to two degrees. On April 17, the patient refused to have any more injections and was permitted to go home, where he died in the early part of June.

Case 2: T. G., male, 64 years of age, carpenter by occupation, was admitted to our clinic at the Manhattan Eye, Ear and Throat Hospital, April 22, 1913. The family history was negative. Past history presented no evidence of venereal or throat trouble. Had had malaria two years previously. At times had been a heavy beer-drinker and a moderate smoker. Present history: About six months previous to admittance to the hospital he noticed that he had difficulty in swallowing, and at times a husky voice and that he was not breathing as easily as formerly.

Physical Examination. General: The patient presented an emaciated appearance, and appeared to be considerably past 60 years of age. The temperature at time of admission was 99°, pulse 88, respiration 18, blood-pressure 165, with fairly advanced arterio-sclerosis. Examination of the urine was negative.

Special Examination: Owing to infiltration at the base of the tongue, there was considerable less of mobility in this member. From the side of the lingual tonsil there appeared a tumorous mass which extended laterally on both sides. The epiglottis was large and edematous, with a ragged left edge and the posterior surface elevated and hard. In the larynx itself the cords were thickened and infiltrated with superficial ulceration and marked loss of motion. The arytenoids were infiltrated and edematous. Both the superficial and deep servical lymph nodes were enlarged on both sides, the left being the most marked. Diagnosis of epithelioma of the base of the tongue, epiglottis and larynx was made by the history and appearance of the growth and confirmed by microscopical examination of removed tissue.

Treatment: On April 29 and 30, 30 ccm. of colloidal mercury was injected intravenously. Following this, 50 ccm. was injected each day until the tenth injection, when this amount was increased to 100 ccm., the actual amount of mercury in solution remained the same. The injections were now given on alternating days because the patient again showed signs of salivation. In all, sixteen injections were given, covering a period of twenty-seven days, with an interval of six days between the seventh and eighth injection, due to marked symptoms of mercurialism. After the sixteenth injection, the patient again became salivated and the general appearance of the growth being unfavorable the injections were discontinued. About this time the glands of the neck became much larger and one had reached such size and produced such discomfort that it was deemed advisable to remove it. Microscopical examination of this gland showed it to be carcinomatous. At the period of the first salivation,

glucose appeared in the urine to the amount of .04, determined by the fermentation process. Glucose continued to be present until the administration of the colloidal mercury was discontinued. In the later stages the urine showed 1.5 grams per liter of albumen, with granular and hyalin casts. Considering the fact that examination of the urine upon admission to the hospital was negative, it is reasonable to conclude that the injections brought about the albuminuria, and other kidney disturbances. The temperature during the period of salivation was about 100° Fahrenheit, but at no other time was there a variation above normal of more than three-fifths of a degree. Both Wassermann and Noguchi tests were positive, each having been made twice. The blood-count showed a moderate anemia, the average red cell count being 4,500,000 per centimeter, and the hemoglobin, 50 per cent. In consultation with Dr. Beebe it was proposed that an injection of an extract of the gland removed from near the tumorous mass should be injected, but the patient refused to submit to the operation. After May 29, at which time the injections were discontinued, until the patient's discharge, June 16, it was necessary to administer opiates to procure rest. The patient died June 23, one week after leaving the hospital.

Conclusions: In the case of cancer of the tongue, the injection of the copper solution seemed to stay the growth for a period of a few weeks, but rapid disintegration of the mass soon after they were discontinued leads one to doubt if the solution was the cause of the retardation of the tumor or if perchance it was one of those non-progressive periods that occur in cancerous growths in which the ravages of the disease seem to be temporarily stayed. The colloid mercury seemed to have no effect on the tumor whatsoever. As regards lessening pain or increasing the function of the part, no benefit can be said to have been derived from the administration of the colloids. The amount of time necessary to administer the solution, the negative effect on the tumor, and the pain and discomfort experienced by the patient incident to the injection apparently do not warrant its administration, either in the hope of a cure or even in the expectation of its acting as a palliative measure. A specific influence of colloidal metals on cancer cells in the human body is yet in doubt and from the experience gleaned from these two cases, it would appear more human to ease the last days of the cancerous patient by sedatives than by the futile use of colloidal metals.

Report of a Case of Tuberculoma of the Larynx. DR. C. JOHNSTONE IMPERATORI.

This patient, J. C., came to the Manhattan Eye, Ear and Throat Hospital and was admitted to the clinic of Dr. Harmon Smith, January 27, 1914. Family history is negative. Previous history: Has always been in good health up to a year ago, when he spat up some blood and within a few days became hoarse. He denies lues. Status praesens: Complains of hoarseness and at times loss of voice. There is no pain. Has no difficulty on swallowing. Very little muco-purulent expectoration. Physical examination: Chest shows slight prolongation of expiration at the right apex—more so than normal. There are no rales. Heart negative. Larynx: Ulceration of the right vocal cord and ventricular band, with marked infiltration of both. There is an over-growth of tissue on the an-

terior commissure, mainly on the right side. Considerable loss of motility of the right cord. Wassermann negative. On January 31, several pieces of tissue were removed from the region of the anterior commissure for pathological examination. The report from the laboratory was that the mass consisted of granulation tissue. Again, February 14, a few days after the report was made, more tissue was removed from the same region indicated above and the report from the pathologist was that the tissue submitted for examination was tubercular. Examination of scrapings taken from the ulceration and the neighboring region was negative as regards tubercle bacilli. The case shows the difficulty of diagnosticating clinically between tuberculosis and syphilis of the larynx. Clinically, the diagnosis would be syphilis. The depth of the ulcer, the raised edges and the surrounding area of inflammation being more regular than in tuberculosis. There is no edema of the ary-epiglottic folds. Regarding treatment, the infiltration being sufficiently large to produce dyspnea, it was removed and the ulceration cauterized with the silver bead. This was done ten days ago. The results are very good as regards breathing and phonation. Regarding the diagnosis, there is still an element of doubt, from a clinical standpoint, whether this is a luetic or tubercular lesion.

The patient will be observed after the injection of tuberculin and then after the application of the therapeutic test—that is, the adminstration of potassium iodid.

DISCUSSION.

DR. FREUDENTHAL, referring to the first case presented by Dr. Smith, said that it was a very interesting case to him, and emphasized the fact that one should not rely upon microscopical diagnosis in such cases unless it be positive. If the history and clinical diagnosis indicate cancer, you may be sure that it is cancer. He had seen a case where large sections had been removed three times and every time the microscopic diagnosis was papilloma. That case had been shown before the section in the fall, and was operated upon by Dr. Torek for carcinoma. The operation was very satisfactory but we must not be surprised if we are disappointed, for carcinoma will recur, whether we do a laryngectomy or not.

He had always felt that Dr. Smith was right in trying to remove as much of the necrotic tissue as possible and leave the man as much of the larynx as he could, although the majority of the men did not agree with this.

DR. THURBER, referring to a case of sarcoma of the tonsil at the Vanderbilt Clinic that he had recently seen, laid emphasis on getting enough of the growth for microscopic diagnosis. The first portion removed in this case showed no malignancy and the growth was taken to be a primary syphilitic lesion by many of those who saw it, but on further examinations the tumor was reported to be a large, round cell sarcoma. The patient was 42 years of age; the growth gave him no discomfort except for its size. On removing it, the lack of hemorrhage was a feature that corresponded to that of the case reported to-night. The tumor was very friable, yet had a gritty hardness. As the tonsillar capsule was not removed, recurrence was expected and watched for and occurred in three weeks, when the patient was referred to Roosevelt Hospital for a radical operation.

DR. GUTTMAN said that he was very much interested in Dr. Abraham's case, and the result was most satisfactory, but he did not understand why the medical procedure followed by Dr. Abrahams was not the usual one. In a case like this, following acute influenza, is not the usual procedure the removal of the middle turbinate, and, if that is not satisfactory, then to go to the antrum, the ethmoid, and then the sphenoid? He would like to know Dr. Abraham's reasons for beginning first with the sphenoid.

DR. ABRAHAM thought Dr. Guttman had misunderstood his report of the case. He had stated that the patient was doing so well under simple treatment that it seemed unnecessary to operate. He did not see the patient for several days and on his return found her suffering from symptoms of marked meningeal irritation, and she was placed in the hospital. He was certain that the sphenoid was involved. The middle turbinate was removed, and the sphenoid was opened, and pus under great pressure was evacuated. The ethmoids were practically all one cell, and were filled with pus; the naso-frontal duct was enlarged and the frontal drained. The operation lasted three-quarters of an hour and the patient was getting very weak. The operation had to be performed with great rapidity, and he removed more of the antrum end of the inferior turbinate than he usually does. All the operative procedure was done at the one sitting, the sphenoid being the main point of attack. The subsequent findings justified this action. He was somewhat thrown off the track in this case, for in his experience in such cases the pain is usually at the apex of the head. This was only the second instance where the pain has been at the base of the skull, near the junction of the spinal column,—which would lead one to believe that the pain was of a different character. The sphenoidal pain is usually at the apex of the head, not at the base.

The Medical and Surgical Aspects of Oral Sepsis of Dental Origin.
DR. WILLIAM HENRY HASKIN.

This paper was in line with Dr. Haskin's paper on "Cryptogenic Infections of the Alveolar Process," read before the Eastern Section of the Rhinological, Laryngological and Otological Society, in January, and published in THE LARYNGOSCOPE, March, 1914, p. 169.

DISCUSSION.

DR. HENRY W. GILLETT said that he had been addressing a dental meeting in the adjoining room and regretted not having heard Dr. Haskin's paper. Dr. Haskin had, however, read part of it to him the evening before and he knew the general drift of it. He had also seen Dr. Haskin's pictures, and if time allowed, could talk about them indefinitely.

In a general way, he was very much in accord with Dr. Haskin on this subject, and it was a source of great satisfaction to the dental men who are interested in the matter from the standpoint detailed by Dr. Haskin, that the medical men are beginning to realize what is going on in the mouth. Dental men have been talking about this in dental societies for years, but it has been very uphill work to get the medical men interested. It has not seemed to occur to many of them that the mouth is the beginning of the alimentary canal. For some reason there has been very little co-operation between the dentists and the physicians in this direction, and this has been greatly to the loss of the patients, both those who consulted the dentists and those who consulted the physician.

This matter of pyorrhea alveolaris is one of great importance to your patients. Many secondary infections come from this cause, and it should be easy for any of you to distinguish many of the common foci of infection in the mouth. An hour or two spent with a competent dentist, who could demonstrate a series of mouths, would enable any physician to detect them without difficulty, to know whether or not any dentist to whom he had referred a patient knew what he was talking about when he reported a patient as being sound in that respect.

Unfortunately, there are a great many men in the dental profession who disregard these conditions and do not give them the attention they should receive. In any mouth, if you find a red, congested gum-margin, which, on pressure, discharges pus, you may know that there is something seriously wrong.

Dr. Haskin is entirely right in his statement concerning the value of the x-ray in dental work. Any dentist who is in the habit of having many cases x-rayed, or who is a progressive man with an x-ray outfit in his own office, can duplicate these pictures by the dozen, showing the same general conditions which Dr. Haskin has thrown upon the screen. Recent research work by men connected with the dental profession has developed convincing evidence of their great importance. It is the ordinary everyday experience of the dentist who is keen on these things to be told by patients that rheumatic disorders have disappeared subsequent to clearing away of pus foci from the mouth. That coincidence so often happens that dentists who are keen on the subject expect that result.

Dr. Haskin referred to persons who do not properly cleanse the mouth. Many of them cannot be induced to do so. It is one of the astonishing facts, familiar to the dental profession, that medical men are among the worst offenders in this respect. It is common knowledge among the dentists that the mouths of medical men average worse conditions than in any other set of people of like intelligence. It is not to be expected that a man who takes that view of his own case would be interested in his patient when a dentist calls attention to it. It does not seem possible that you gentlemen realize what is going on when a dentist reports to you that a patient has pyorrhea alveolaris. Do you realize that there may be around the root of a single molar tooth the equivalent of a square inch of ulcerating surface; that in a single mouth there are often two or four square inches of ulcerating surface; that each closure of the jaws forces septic material into the circulation? What do you do when a patient comes to you with an ulcerating surface anywhere else? You pay attention to it with great promptness; and yet patients come to you who should have the very best medical service obtainable, but from lack of co-operation are having service that is spreading infection through the whole system.

There is need for more co-operation between the two professions in this respect. I adopt the rule now, to take cultures from pus foci in the mouth and report the findings to the patient's physician whenever it is possible to do so.

There is a great deal of carelessness in the dental as well as in the medical profession. We have to deal with men who are uneducated, and with others who are educated and disregard the facts, but there is a class of dentists who are interested in this work and who are ready to

co-operate with you, who welcome the responsibility it entails and the evidence that the medical men are waking up to the conditions existing in the mouths of many of their patients.

DR. E. A. BOGUE expressed himself as greatly pleased to find his fellow members of the medical and dental professions waking up to the great importance of a subject which so greatly concerns them both, and told of a lady whose name was well known to most of those present who had, some years ago, brought her little daughter to him, saying that she had taken the child to a well-known children's specialist to find out why her gums bled so excessively every time she ate. The specialist, who is even better known than the child's father and mother, had treated the condition as a matter of no consequence. On examining the child, who was only 4 years old, he found to his astonishment that she had pyorrhea, which he has never before nor since seen in so young a person. So, when confronted with instances of crass ignorance on the part of some dentists, it is only fair to conclude that there is some of the same quality elsewhere.

Dr. Haskin had probably not meant to show all of the conditions which cause necrosed alveoli, for many such conditions exist where no pus is visible, but he came very close to telling why a blind abscess exists or what causes it. Dr. Bogue said that he would very much like to know whether the pulps in these teeth were recognized as being invariably dead, or not. It seems to be Mother Nature's method of endeavoring to throw off a foreign substance, and that is the *abs cedo*.

He noticed that Dr. Haskin had used rather indiscriminately the words caries and necrosis, but in either event he was right in directing the attention of medical advisors to cases in which either the one or the other condition is present. Furthermore, there came into his remarks the question of whether or not pyorrhea alveolaris can be prevented. Dr. Bogue said that within the past forty-eight hours that question had been asked him by a man who had "suffered many things of many physicians and was none the better." Among other things, he had suffered the loss of his two upper lateral incisors and one first lower molar, which left the upper dental arch smaller than the lower, instead of larger. Dr. Bogue said that he had replied to this gentleman that it was impossible that he should ever again have good articulation of his teeth; and as long as that was done with, it was impossible that he should have automatically, physiological cleanliness of his dental organs, even if he went back to Mother Nature's method and ate no cooked food as Nebuchadnezzar did, for there would still be little corners which would be filled up with deposit which could not be removed by the movements of mastication or the tongue.

Dr. Bogue recommended to him the use of a tufted or serrated brush as the best means of keeping the teeth free of deposit after eating. One must not only fight against decay of the teeth, but against deposits of various kinds, including the calcareous ones which originate pyorrhea by acting as foreign substances, causing the gums to form pus in order to throw them off. The brush should be serrated in order to reach into the interstices of the teeth. Dr. Bogue described how it should be used, in a rotatory manner, thus brushing the teeth up and down and the gums as well. After the teeth have been cleansed in this way as well as possible,

raw silk should be passed between the teeth, simply to act as a little towel to complete the cleansing. If this is done regularly and the dentist is visited periodically so that the necks of the teeth are kept smooth and polished, the gums will show a smooth, hard surface and there will be no pain nor bleeding.

DR. M. L. COLLINS took exception to what Dr. Haskin had said about blind abscesses. If he understood correctly, Dr. Haskin said he did not believe there is such a thing as a blind abscess. The last photographs thrown upon the screen were taken from dry specimens; there is no doubt that if these same specimens could have been seen with the soft tissues intact, they would have been all fistulous, the discharge entering the mouth. I agree with Dr. Haskin; these are not blind abscesses. But what should be said about those spaces at the apices where the radiograph shows destruction of bone which are not fistulous, In these cases, if the soft tissues are punctured and so on through the outer plate of alveoli, we at once plunge into an abscessed cavity. I have seen hundreds of such cases and would certainly call these blind abscesses.

DR. HASKIN replied that that was the point at issue. He could not believe that they are so. He felt confident that if one could examine them all around with a microscope that a small tract would be found. He is not a dentist, but it does not seem possible that they should be absolutely closed.

DR. COLLINS replied that if there was much of a tract there would be a discharge, and if there was a considerable tract this would not then be a blind abscess, as would be apparent from the radiograph. There was no doubt in his mind that the blind abscess is a fact, the discharge of which gets into the blood-stream. He was very glad to have heard the paper and to know that these matters are being studied by physicians, as well as by dentists.

DR. ABRAHAM said that he had had considerable experience with empyema, following abscess of the root of the tooth, and one case would illustrate the experience of many. A patient, who had a discharge of a purulent character, had been referred to him from a neighboring city. This patient had had the nerve of a tooth killed and the tooth filled. He referred her back to her dentist with the diagnosis of empyema of the antrum, following an apical abscess. The dentist was positive that there was no apical abscess. Dr. Abraham said that he had made his diagnosis from a radiograph and told the patient that the tooth had to come out. The dentist insisted that it should not be removed. Finally the patient was sent to Dr. Hasbrouck for the tooth to be extracted, with the request that he pay particular attention to the condition. When the tooth was removed, a typical apical abscess, surrounded by necrosed bone which discharged into the antrum, was found. When Dr. Hasbrouck extracted the tooth he removed the necrosed bone surrounding the tooth. This opening was immediately closed and the antrum was then opened intra-murally, and a pyogenic membrane covered by a polypoid mass was found. This was curetted gently and the cavity was treated with argyrol solution. The patient was discharged in three weeks, after having suffered for years. The dentist admitted his error and complimented Dr. Abraham on his diagnosis. This was the history of but one of many similar instances. Dr. Abraham stated that he did not pretend to say what was the cause of

this necrosis at the base of the tooth, but it was certain that these conditions follow very often after a nerve is destroyed and the tooth filled.

DR. BOGUE told of a physician who had brought a patient to him when he first came to New York, saying that penetration of the antrum was suspected owing to the death of the tooth pulp. Examination showed that the tooth was in the antrum and that there was an abscess so offensive that marriage had been postponed. The patient, however, still had the tooth when last seen. She was a young lady then, but her son is now on the Board of Health.

In reply to an inquiry as to how it was cured, Dr. Bogue said that he managed to secure an ingress and egress by making one hole through the tooth into the antrum, and another through the canine fossa. When this case was reported in England, Charles Tomes, of London, shook his head and said that the success in this instance justified the means, but that the method was entirely wrong. Dr. Bogue said that it could not be done every time, but he simply mentioned it as a case that did occur. Dr. Bogue said that he had successfully treated very many cases of abscessed roots, even going so far as to extract the tooth and replace it in the socket, after amputating the necrosed end of the root.

DR. DANZIGER said that the paper was a most important one, as it had a tendency to change our views very considerably on the question of cryptogenetic sepsis. Discussions in future will not be only what mode of removal of tonsils should be employed, but rather, look for the focus of infection in the mouth, nose, or teeth, and rather regard the enlarged tonsils as a secondary inflammation of a lymph gland.

DR. MYLES said that it would be a great advantage if our methods of diagnosing peri-odontitis could be improved. It seems probable that the proportion of antral cases due to tooth infection has been increasing in the last ten or fifteen years on account of the improved dentistry. Anyone who submits to the process of saving his teeth by having the nerves killed, or who retains an old tooth with a dead nerve in it, runs some risk, because there is probably some pathogenic condition in and beyond the root-end. He had observed this in a great many instances where the tooth was extracted. He objected to the way in which many have their teeth saved and take the risk, and then blame the dentist if trouble ensues later.

DR. HASKIN thanked the gentlemen who had discussed the paper and expressed his high regard for the men whom he knew in the dental profession who were far better informed on this subject than he could ever hope to be. When you meet a good dentist you can pin your faith to what he says.

Dr. Bogue had spoken of pyorrhea in a young child. Dr. Haskin said that last week he had seen a child, 11 years of age, with a fearful pyorrhea, who had been under the care of a well-known specialist. The child had the usual discharge, and all the pockets were full of streptococcus infection. The child is now under vaccine treatment, and it is hoped that that will help cure the condition after the teeth have been cleansed.

Replying to what Dr. Bogue had said about the causation of apical abscesses, Dr. Haskin said that he had stated in the paper that he believed they were caused by inflamed pulps, improper handling, or some blow,—traumatism—but that the great majority were due to inflamed pulps.

The main reason for directing attention to this question of oral sepsis is that the medical profession have done wrong in neglecting these conditions. If they are observed early, and the defects of mal-occlusion and over-crowding are appreciated and checked in the beginning, the pyorrhea could be prevented, just as early attention to nasal obstructions prevents the horrible conditions that are often seen in later life. They cannot be overcome in the older men and women, for they have existed too long and atrophy has taken place. Many times the teeth must be taken out, for it is impossible to check the condition. If one is on the look-out for the condition, however, and gives it attention early it can be stopped.

Regular Meeting, March 25, 1914.

Pansinusitis. DR. JOHN E. MACKENTY.

About seven years ago the patient had what she considered to be a constant cold in the head, and she had nasal trouble up to two years ago when she was admitted to St. Luke's Hospital. Examination revealed that her nose was full of polypi, and she was operated upon without much relief. Later, she went to the Presbyterian Hospital and was again operated upon without relief. Her chief complaint was asthma of a very severe type. Then she was sent to the Manhattan from the Presbyterian Hospital and it was thought she would die of her asthmatic attacks. Dr. MacKenty said that he wanted to do an intra-nasal operation but was convinced that it would not do any good; and as he was afraid to let her go on with the asthma he did a double radical external operation. One side healed nicely. The other side (right) failed to heal and went on suppurating. Then it was decided to do a second operation on this side. No dead bone was found. The former operation was done all over again, the cavities cleansed, and the wound sewed up. The same thing occurred again, and after waiting a few weeks a vaccine was used—three doses were administered. The infection was found to be pure streptococcus. After the third dose, the condition healed like magic. The septum underwent polypoid degeneration and had to be removed intra-nasally. Dr. Dwyer made a pathological examination and reported polypoid degeneration.

After the first operation the patient had no attacks of asthma for about ten weeks, and then the septum took on a degenerative process. As long as the nose is kept free from scabs, she has a great deal of relief, but when it gets full of scabs she has the asthma again.

The case is reported: First, to show the quick effect of vaccines when a good culture is obtained; second, to show the more or less rare polypoid degeneration of the septum; third, because of the severe type of asthma, which was almost fatal.

The last dose of vaccine was given about ten days ago. The first operation was done on December 18; the second, on January 15; the third, removal of the septum, on March 5.

DISCUSSION.

DR. DWYER said that this case was interesting in that after the operation a pure streptococcus culture was obtained, which is rather rare. If we can get down to bed-rock and get a culture, we can do a great deal with vaccines. It must be borne in mind that with polypoid degeneration of the septum or of the floor, non-pedunculated and bleeding very freely, we have to look out for secondary degeneration and sarcoma, which is quite common in areas that undergo polypoid degeneration first. Dr. Dwyer said that he thought the eosinophiles here were accidental in the blood. There are generally an indication of trichina or some sort of protozoa, so that in this case it seems to be an accidental secondary bacteria.

DR. COCKS asked Dr. Dwyer if he thought that polypoid degeneration in the nasal accessory sinuses, such as the maxillary antra, is especially apt to be followed by the development of sarcoma.

DR. DWYER replied in the affirmative.

DR. MYLES said that he did not really understand what the pathologists mean by polypoid degeneration, for it is a very common thing to see a so-called polypoid condition in these conditions which, when the venous congestion is relieved and the pressure removed, comes back to normal. He has seen a septum resembling the polypoid condition which passes away, and operations on the cribriform plate that have caused edema which pass away when the circulation is re-established. So it is a question of what one would call polyps.

About fifteen or twenty years ago it was his custom to report cases where the antrum was filled with polypi. Most of them grew from the upper part of the cavity and in many instances they would disappear when the general pressure and circulation were relieved by operation. It is astonishing what large ones will disappear. Many of these tissues when submitted to the pathologists would come back with the same report. It is a question of what is a true polyp—whether it is capable of going back to normal. It would seem that most all flat polyps have that power.

Chronic Frontal Sinusitis Suppuration Complicated by Epidural and Orbital Abscesses. DR. GERHARD H. COCKS.

The percentage of deaths in epidural abscess complicating frontal sinus operation is so high that we are perhaps warranted in reporting such a case if the outcome is successful.

The patient, an Italian, 31 years of age, was referred to Dr. Chappell's clinic at the Manhattan Eye, Ear and Throat Hospital on December 8, 1913. The family and previous history throw no light on his present illness, except that he had grip about fifteen years ago. For the past ten years he has suffered from post-nasal and nasal discharge, mucoid in character. About three or four months ago the patient first noticed a swelling at the inner angle and roof of the orbit. This gradually increased in size. At the time of admission, the swelling was about the size of a twenty-five cent piece. There had been some frontal headache, but no discharge of pus from the nose.

When first examined no pus was found in the nose. Two days later a slight amount of pus was detected in the middle turbinate region. The globular swelling at the inner angle of the orbit showed fluctuation. An x-ray examination demonstrated a cloudy right frontal sinus with a thickening at the margin of the orbit. This thickened area was later, at operation, shown to be the site of perforation into the orbit.

An external operation was performed on December 10, 1913, with the usual skin incision through the eye-brow and down on the side of the nose. When the periosteum was incised there was a gush of pus. A defect, about the size of a five-cent piece, was found in the roof and inner wall of the orbit where the latter communicated with the frontal sinus. The frontal sinus cavity was filled with thick yellow pus. In the posterior plate of the frontal sinus were two defects in the bone, the larger of which was the size of a twenty-five cent piece. The dura was here discolored and bathed in pus. The diseased ethmoids and sphenoid were next exenterated and the middle turbinate was removed. On account of the exposed dura it was deemed inadvisable to attempt to save any part of the anterior bony wall of the frontal sinus or the remaining portion of the bony bridge. This bone was therefore removed and the cavity was packed from the bottom with iodoform gauze. Two or three sutures were placed in the outer angle of the wound, but it was found necessary to remove them a couple of days later on account of a skin infection.

On December 30, 1913, twenty days after admission, the patient was discharged from the hospital, but returned to the clinic for dressings. On January 19, 1914, the patient begged to have a smaller dressing applied so that he could use both eyes for his work. The gauze dressing was therefore discarded and a cotton-collodion dressing placed on the skin wound. Two days later he developed facial erysipelas. The wound is now practically closed and the nose is almost entirely dry.

A culture taken from the pus at the time of operation showed a capsulated diplococcus. There is, naturally, considerable facial deformity, but the patient is unwilling to subject himself to any further surgical procedure for its relief. There has been no diplopia, in spite of the extensive removal of bone.

DISCUSSION.

DR. CARTER thought that a good deal of the scarring could have been avoided if intra-nasal drainage had been established. Several cases that he has operated upon have been drained very satisfactorily by greatly enlarging the naso-frontal duct; this greatly reduces the scarring.

In this extensive case where there was considerable bone necrosis drainage in this manner might not have been possible.

DR. MYLES commended Dr. Cocks' procedure and thought that it gave the patient a better chance of recovery. He would have had a deformity anyway, so far as the depression was concerned, and Dr. Cocks did the sane thing in allowing it to heal over in order to cure the patient, and then use some method to improve the scarring afterward. The scar was nothing in comparison with the results obtained.

DR. MACKENTY agreed with what Dr. Cocks had said about the drainage. Exposure of dura is not serious providing free drainage is used. If Dr. Cocks had made the avoidance of the deformity his first object

he would probably have lost his patient. It would seem that the success was due to the drainage employed.

DR. GUENTZER asked if the picture was not clearer than one would have expected with all the complications.

DR. GUENTZER recalled the case of a negro woman with a complicating frontal sinusitis. On operation there was a good deal of specific necrosis of the posterior frontal wall, exposing the dura, but the woman went on to recovery without any particular symptoms. The exposure of the dura did not seem to make the case any more severe than usual.

DR. COCKS said he was glad his case, had aroused such general discussion. Like Dr. Myles, he feels that packing the wound so as to make it heal from the bottom is by far the safer method in such cases as the one shown.

Repiying to Dr. Cocks:

DR. MACKENTY said that the success was due to the fact that drainage from the outside was used. Intra-nasal drainage seems to be a mistake in such cases.

Some Important Conditions Connected With the Surgery of the Jaw and Mouth. DR. HENRY SAGE DUNNING.

To be published in full in a subsequent issue of THE LARYNGOSCOPE.

DISCUSSION.

DR. ABRAHAM, referring to the cases involving the teeth and antrum, said that at the last meeting he had spoken of a number of such cases which had fallen under his observation. That very day he had a similar experience with a patient who had been referred to him about a week ago suffering from neuralgia which radiated into the antrum and the supra-orbital region. The patient had consulted a physician who made a diagnosis of grip and neuralgia, and treated the patient without result. The patient was then advised to consult a dentist who failed to find anything to account for the condition. The patient was then sent to an oculist who examined her carefully and failed to find anything. He suggested that the nose be examined and referred the patient to Dr. Abraham. Upon transillumination he found positive symptoms and dullness on the right side, and advised that an x-ray picture be made. The plate came back showing involvement of the antrum with an apical abscess of the pre-molar teeth. The patient was sent to a dentist to have these teeth removed, and then to be returned for further treatment. This was a typical case of a patient having a nerve destroyed and suffering subsequent pain and infection of the antrum. None of them can be cured until the diseased teeth, necrosed bone, and roots are removed.

DR. HAYS said that it is rather important for the nose and throat specialist to work more in harmony with the dentist, particularly one who can take x-ray pictures. It is of the utmost importance where one is dealing with some complex condition to be able to eliminate the teeth sockets as the source of the trouble. There are certain dentists to-day who make a practice of taking an x-ray picture before and after filling teeth, and these x-rays often show abnormalities around the roots of the teeth, or in the antrum which need attention. In the last two or

three years it happened that Dr. Hays saw a number of these cases. One man whose face was very much swollen had an x-ray picture taken which showed a definite shadow over the right antrum indicating pus in this cavity, but on account of the swelling and brawniness of the tissues the diagnosis of alveolar abscess was made. An incision was made at the hospital under gas anesthesia, along the gingivo-labial fold resulting in a discharge of a large amount of fetid pus, evidently arising from a necrosis of one of the roots of the teeth. In another case in which there was a severe pain in the right cheek, transillumination of the antrum showed a definite shadow on this side. The patient had some gingivitis which awakened a suspicion of trouble in the teeth, and he was sent to a dentist who took an x-ray picture which showed a great deal of disease at the base of the teeth, and a diseased condition of the floor of the antrum. This was attended to, and the patient was relieved. When we get pictures showing antrum disease it is very probable that there is some tooth trouble which is causing the infection.

Dr. Myles said that it would be a great advantage if we could improve on our methods of diagnosing peri-odontitis. It seems probable that the proportion of antral cases due to tooth infection has probably been increasing in the last ten or fifteen years on account of the improved dentistry. Any one who submits to the saving of his teeth by having the nerves killed, or retains an old tooth with a dead nerve in it, runs some risk, because there is probably some pathogenic condition in the tooth. He has observed a great many cases where the tooth was extracted, and he does not see how the dentist can destroy all nerve tissue; when these cases break through into the antrum they are often relieved; they create a little antrum trouble, but not much, and continue discharging for years and years. There is a very moderate amount of periosteitis kept up by the root-end of the teeth.

Dr. Myles said that he objected to the way in which many men have their teeth saved in this way and then blame the dentist. We should take the chance when we have that condition. He has noted such teeth that were filled up to the root-end, but beyond that, where the dentist could not treat the condition, there would be trouble. The removal of such teeth is very beneficial when everything else fails. He has noticed that when there is an operation through the inferior meatus for the purpose of keeping up a permanent opening, a little muco-pus will come in, and the floor will feel rather boggy, and sometimes curettement will be necessary; but to clear it up entirely there is nothing to be done but the entire removal of the teeth.

Dr. Dunning said that what Dr. Myles had pointed out was very true, —the improved technic in filling the tooth canals has, in a way, increased the number of infections. Attempts have been made to save too many diseased teeth. It is impossible when the apex has become infected and the peridental membrane is involved, to absolutely clean around the end of the tooth. It must either be removed, or one must go above and amputate the root. If any pus is left in the alveolar process, or diseased tissue remains, the infection will light up again in nearly every instance. If more of these teeth were removed in the beginning it would be much better for the patient. There is too much conservative work done on diseased teeth.

PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Regular Meeting, January 20, 1914.

DR. E. B. GLEASON, *Chairman.*

(*Continued from page 564, May, 1914.*)

Results of Intra-nasal Operation of Fulminating Case of Sub-acute Frontal Sinusitis. DR. HERBERT M. GODDARD.

Male, age 60. In February, 1913, contracted cold, duration one month. Symptoms: Constant headache, drawing eye from side to side; marked swelling on nasal side of left eye, severe attacks of vertigo, unable to see across the ward.

August 22, again in hospital, protrusion of eye and marked swelling of upper lid. Ophthalmologist diagnosed orbital abscess. Intra-nasal examination revealed great swelling. After shrinking with 20 per cent cocain solution, middle turbinate found much enlarged. Free discharge of pus; diagnosis, frontal sinusitis. Anterior portion of middle turbinate removed and sinus probed; patient promptly relieved. December, a recurrence of symptoms. Insufficient drainage. Killian operation with Sullivan's graduated rasps, making very large opening into sinus. Patient cured.

Presentation of Two Frontal Sinus Cases. DR. FIELDING O. LEWIS.

Case 1. M. K.; white; schoolgirl; had tonsils and adenoids removed May, 1913. The following August she came to the Jefferson Hospital complaining of pain over the frontal region and nasal discharge. Nasal polypi were removed from the right side of the nostril, and a portion of the middle turbinate was removed to facilitate drainage. She was relieved for a short time; but later the symptoms became more pronounced, and a radical frontal sinus operation was performed the following September. The frontal sinus was filled with granulations and pus. A modified Killian operation was performed and the patient has made an uninterrupted recovery.

Case 2: An Italian laborer was referred to the Nose and Throat department of the Jefferson Hospital, from the Eye Department, with an external sinus leading from the upper eyelid, on the left side, into the frontal sinus, which was discharging pus.

X-ray examination and transillumination revealed a probable empyema of the left frontal sinus. A modified Killian operation was performed; the sinus was found to contain granulations and pus; septum between the two frontal sinuses was absent; was unable to determine whether it was congenital or pathological. The right sinus however was not open externally. After daily irrigation the symptoms subsided.

A few months later there was found a discharge coming from the line of incision at a point corresponding to the inner canthus of the eye and I believe it was due to an infection of the right sinus, which we shall operate on later.

Demonstration of External Operations on Frontal Sinus. DR. E. B. GLEASON.

The doctor by aid of specimens of his own preparation and blackboard demonstration very clearly explained the steps of the Killian operation and modification thereof.

DISCUSSION.

DR. COATES called attention to the fact that the Killian operation was not done to establish drainage, but to eradicate the diseased mucosa and to eventually obliterate the sinus. This makes a radical difference from all intra-nasal procedures where the object is to obtain drainage, and, as pointed out by Ostrom in a recent issue of the *Illinois Medical Journal*, ventilation, which may be even more important. In the true radical (Killian) operation obliteration is accomplished by removing the entire anterior and inferior walls and allowing the cavity to fill in with orbital fat, etc. Anything short of this complete removal differs from the true radical, though the ultimate results may be as good.

Dr. G. M. Coates presented a patient on whom a complete radical (Killian) frontal operation had been performed four years ago. She was a tubercular patient doing badly on account of the intense suffering she had undergone for two years before. The intra-nasal operation had not given sufficient relief in her case, and the radical operation was performed. Recovery was rapid and complete, and the relief experienced absolute. Now once in six months there is some crusting, otherwise there is no nasal discomfort. Her pulmonary condition is entirely arrested. The cosmetic result is first rate, although the entire anterior and inferior walls of the sinus were removed, and the sinus itself was a large one.

DR. CHARLES P. GRAYSON: The careful study of group cases like this teaches us much regarding treatment. We should be cautious about adopting the radical course. Dr. Goddard's case very clearly exemplifies this point. Failing in the conservative the radical can always be performed later on. Of course, in certain cases the latter procedure is unmistakably necessary, and nothing but an external operation will cure or relieve. In these border-line cases, however, give the patient the benefit of the doubt. Get his point of view as well as our own, and if he prefers the more tedious or conservative course be guided by his wishes. All have seen cases radically treated and results not perfectly satisfactory, patient's second condition not much better than the first. In these cases gradually we will become more discriminating. In private practice many would never require operation if our services were enlisted earlier. The early recognition of such cases by the general practitioner is of the highest importance, and this involves education. In the college the student must be impressed with diagnostic points.

DR. CHARLES F. ADAMS dwelt on the importance of enlargement of drainage. Formerly we were satisfied with small passage. Introduction of graduated rasps will save many from radical operation.

Regular Meeting, February 17, 1914.

Case with Adhesions Between Soft Palate and Larynx and Stenosis of Larynx. DR. FIELDING O. LEWIS.

A specific case—initial lesion two years ago; later developed sore throat and reported to clinic eight months later; given mixed treatment of mercury and iodid potash for six months. At present no active lesion, all fibrous tissue.

DISCUSSION.

DR. THOMAS J. HARRIS recommended examination by direct method, soft catheter in esophagus and larynx to determine amount of narrowing. Referred to anti-leutic treatment and fibro-lysin, but not to nose and pharynx.

Chronic Stenosis of the Larynx. DR. THOMAS J. HARRIS.

Tracheotomy and intubation, the two chief immediate causes. Tracheotomy as a cause the result of an imperfectly performed operation. The importance of lower, or media tracheotomy to be recommended. Construction of the trachea canula a further cause. Intubation not an unalloyed benefit in acute stenosis. Diphtheria, the most common exciting cause, can, however, produce a narrowing without intubation tube.

Chronic hypertrophic laryngitis and cicatrical tissue the two chief pathological conditions met with. The importance of thorough examination as an aid to correct diagnosis of the condition present. The direct examination in the case of children.

Prognosis: Treatment; discussion and comparison of the non-surgical methods of Schroetter, O'Dwyer-Rogers, and Thost. Dangers of autoextubation and the importance of permanently retained tubes. The surgical procedures, including laryngostomy. Relative merits as compared with non-surgical procedures. Thost's, Roger's and Sargon's statistics.

DISCUSSION.

DR. GEORGE C. STOUT: For treatment of chronic stenosis of luetic origin great mechanical ingenuity and very ingenious device necessary to prevent stenosis above tracheotomy tube. Dr. Stout exhibited tubes of his own invention, in sets of three or four sizes, for obtaining pressure and absorption. One case in which the opening was maintained for six years, suddenly died; center of respiration worn out, theory advanced as possible cause of death.

DR. S. MACCUEN SMITH said he was surprised to hear how common these cases seem to be. We are forced into different lines of work, even in our strictest specialities. Dr. Smith referred to a case he saw at Germantown Hospital, stenosis of larynx of post-diphtheric origin. Dr. Cohen had advised deferring operation until patient was 6 years or more. Later, case fell into the hands of Dr. Skillern.

DR. ROSS HALL SKILLERN reported case of baby boy referred by doctor in country. Marked stenosis, no history, during direct examination patient collapsed and in extremis; quick, low tracheotomy; under anti-luetic treatment no improvement. Probability of post-diphtheritic

paralysis prompted use of strychnia for prolonged period; uneventful recovery.

DR. A. ALEXANDER RANDALL asked for information regarding fibrolysin. Has never used it, but had heard of induration following and remaining for years. Dr. Randall has used serolysin by the stomach in ear cases.

DR. ROBERT F. RIDPATH: Last summer at the London Congress, large tubes were advocated and it was also noted at the various German clinics less edema followed the use of the larger tubes.

DR. GEORGE W. MACKENZIE has met with relatively few cases of stenosis of larynx. Case with specific history referred by Hajek. Dilated with tubes like Von Schroetter's but more elliptical treatment for three or four months; patient eventually educated in self use of tubes. Removed half of larynx in a case of carcinoma. Partial stenosis; used solid graduated bougies, four sizes, great difficulty with granulations until burned down, then little trouble.

DR. HARRIS, in closing, emphasized importance of constant and complete preparation in emergency in stenosis of larynx. Manhattan Hospital now has operating set in every ward in every clinic. Dr. Harris referred to a case of compound stenosis in man, aged 40; breathing only through tracheal wound, diagnosis not established, no attempt to dilate until came under his case. Rubber canula used for a day or two, then Schroetter tubes, first for a few seconds and later for five minutes, until complete dilatation secured. Occasionally a child tracheotomized and no obstruction found has great difficulty in breathing. Edema low down, application of adrenalin well down through tracheal wound will reduce swelling.

Regular Meeting, March 17, 1914.

Presentation of a Case of Specific Perforation of the Soft Palate. DR. GEORGE M. COATES.

This case was presented because of the early stage of the disease when first seen and from the fact that a second perforation in the hard palate is at the present time just starting. The destruction of tissue was very rapid and the Wassermann test positive. Salvarsan has not yet been administered.

The Surgery of the Tonsils as it Relates to the Functions of the Tongue and Soft Palate in the Production of Voice. DR. G. HUDSON-MAKUEN (by invitation).

Published in full in the May issue of THE LARYNGOSCOPE, *p. 508.*

DISCUSSION.

DR. D. BRADEN KYLE: There is no question that much unnecessary surgery has been done. There are some fine voices, grand opera singers, that to his personal knowledge have no tonsils. Different methods of

training the voice must be based on irregularities of adhesions in the lateral walls of the pharynx. Taking out the tonsils does not affect the acoustics of the voice. Some extra effort is often required, due to a defective muscular action, in placing certain tones. As much risk of scarring and interference in tone production is experienced after tonsillotomy as after tonsillectomy.

DR. GEORGE FETTEROLF: Dr. Makuen draws a rather drastic picture of the results of tonsil enucleation. Sometimes extreme disfigurement occurs but not always. By frozen section he has found that the palato-pharyngeus lies much further forward than is usually supposed, and is frequently damaged in cutting around the upper pole. In his own experience mutilation is due to this one thing and he therefore no longer makes this incision and the following cicatrices are not disfiguring. It is the taking away of the mucous membrane of extra-tonsillar areas that causes deformity. The palato-glossus muscle is often very small. Dr. Fetterolf here demonstrated a dissection of the lateral wall of the pharynx.

DR. E. B. GLEASON recalled a case where most of the lateral wall was removed for sarcoma, but where a perfect speaking-voice resulted. Removing tonsils enormously increases the size of the resonant cavity, which must have some effect on the voice. It is not the way a pharynx looks after operation but the way it behaves that is important. He remembers one tonsillectomy where it was claimed that the singing voice was ruined and another where there was impairment of the speaking voice and singing voice by the resulting cicatrix.

DR. G. K. MCKENZIE: We should be charitable in regard to the work of other operators, for we all have accidents at times. I have seen the palato-glossus frequently lacerated without harm to the voice. The question arises whether we should be the sole judges as to the advisability of removing tonsils when the case is referred by an internist with a request for operation. The paper of Dr. Makuen's is a masterpiece and we should all take warning not to be too radical in removing diseased tonsils that may be cured by more conservative measures.

DR. E. L. VANSANT: Dr. Makuen drew attention to the fact that after operation the palatal arches usually do not look so well, but has overlooked the fact that pathological change has taken place there, due to enlarged tonsils. The palato-glossus and palato-pharyngeus have been stretched and hypertrophied which is the cause of trouble after operation. He believes that it is better to remove the tonsils entirely. Vocalization is not usually the reason why tonsils are taken out, but the singing voice should be kept in mind. Many amateur singers, who can only sing because of pathological conditions in the pharynx, do so because they have been trained that way. Remove the tonsils in these people and you change the whole mechanism at once and it is impossible for them to sing; the voice is lost. They must be thoroughly retrained and re-educated.

DR. FIELDING O. LEWIS: It is often a question of surgical judgment whether hypertrophied tonsils do not interfere with voice production and the voice become better after their removal. All operators should un-

derstand the indications for complete tonsillectomy and also for tonsillotomy. Adhesions are often the result of lack of treatment, afterwards.

DR. WILLIAM B. HITSCHLER reported the case of a man who had frequent attacks of tonsillitis. For a few weeks after his operation his singing voice was damaged, but later the quality became better than ever. Cases operated upon seldom return for observation and we often do not know the amount of scar tissue that has formed. He has seen some cases where the scar tissue was so enormous that the movement of the tongue was interfered with. He is inclined not to do as much enucleation as in the past.

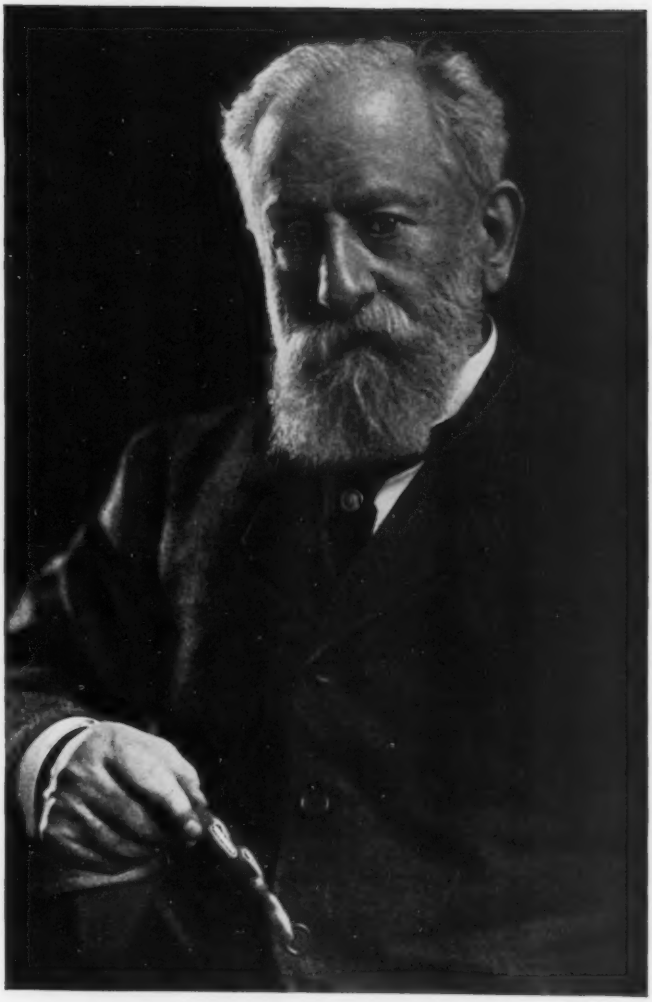
DR. C. F. ADAMS, speaking in reference to leaving the capsule, said he was often chagrined to find that the fossa would fill with fibrous tissue and old conditions of irritation would return. He therefore now takes out the capsule entire. He has no difficulty in enucleating and has little scar and few adhesions of the muscular tissue. The pillars then look natural. He mentioned one case of falsetto voice with lack of control in which, ten days after he had removed the tonsils, a splendid basso voice developed, which the patient soon learned to place.

DR. ROSS H. SKILLERN confessed that he was not satisfied with his tonsil work. Immediately after operation all seems well, but when the patient returns later, bad contractions are seen. He does not know why this should happen, but knows that it does so in almost all cases and that some cases where he is sure the work has been well done, the results are disappointing. He thinks the sooner we find the remedy for the trouble, the better.

DR. P. S. STOUT operated on a singer for attacks of tonsillitis and frequent loss of voice. Four years later the voice had improved very much.

DR. G. HUDSON-MAKUEN, in closing, said that singing is largely psychic, which explains why bad mutilations have sometimes not affected the voice. Some people have the singing instinct and cannot be kept from singing, while in others a very slight injury will spoil the voice irretrievably. He has endeavored to show the results of these operations on the delicate vocal instrument. After an extra-capsular operation, the singing voice cannot be quite as good as before. Some impairment must take place, no matter how well the operation has been done. Sometimes abnormal tonsils do so much harm to the voice that they must be removed. This is a very delicate operation and the least satisfactory to him. He believes the capsule is the crux of the matter, but he does not want to go on record as being always opposed to the extra-capsular method. It is the only thing to be done in children and beautiful results may be obtained.

ERRATA: In Dr. Amberg's article, page 543, May, 1914, the legends under the cuts were transposed.



E. Gruening

IN MEMORIAM.

Dr. Emil Gruening died at his residence in New York City, May 30, 1914, in the seventy-second year of his life, of cerebral endarteritis, after a short illness.

He was born in Hohensalza, Prussia, October 2, 1842, came to the United States in 1862, and became a student in the College of Physicians and Surgeons soon after his arrival.

He enlisted in the Union army in the Seventh New Jersey Volunteer Infantry and saw service at Hatcher's Run, before Petersburg, and in the campaign which ended in the surrender of General Robert E. Lee, which he witnessed.

At the close of the war he returned to his medical studies and was graduated in 1867. In 1871 he was appointed an assistant surgeon to the New York Ophthalmic and Aural Institute, of which the late Dr. Hermann Knapp was executive surgeon.

Some few years later he was appointed to the position of Ophthalmic and Aural Surgeon to Mt. Sinai Hospital and to the German Hospital, as also Ophthalmic Surgeon to the New York Eye and Ear Infirmary.

He served these institutions faithfully for over thirty-five years, holding honorary positions in each at the time of his death.

He was president of the American Ophthalmological Association, as also of the American Otological Association and received every possible honor at the hands of his colleagues.

He devoted himself exclusively to ophthalmology and otology, and was an assiduous worker in those fields.

He was the first in this country to develop and perfect the mastoid operation and many of the best-known American otologists were his pupils, as well as his ardent admirers.

In every thing that he did, Dr. Gruening was thorough. He spoke German, English, French and Italian fluently; he was an accomplished classic scholar, and he was a connoisseur in music and fine arts. He showed his love for humanity by his constant and untiring work for the poor in the hospitals with which he was associated.

He had the courage of his convictions and he was firm in his defense of them. When once he selected a friend he was constant and loyal and one could feel honored and proud of that friendship.

In his private life he shone best. A brilliant conversationalist, with a fine sense of humor, gentle, courteous and dignified, he graced any gathering. A great scientist who would have won a title in any other country, not that he ever wished for that, for he was proud of his American citizenship; a skillful operator, kindly in his faithful care of those who sought his help; a loving husband and father, and a loyal friend. Those who knew him best bear him in fond and loving remembrance. We shall miss his wise counsel, good will and encouragement, and sadly bid him farewell now that he sleeps in eternal rest.

EMIL MAYER.